ANNALS SURGERY

A MONTHLY REVIEW OF SURGICAL SCIENCE AND PRACTICE

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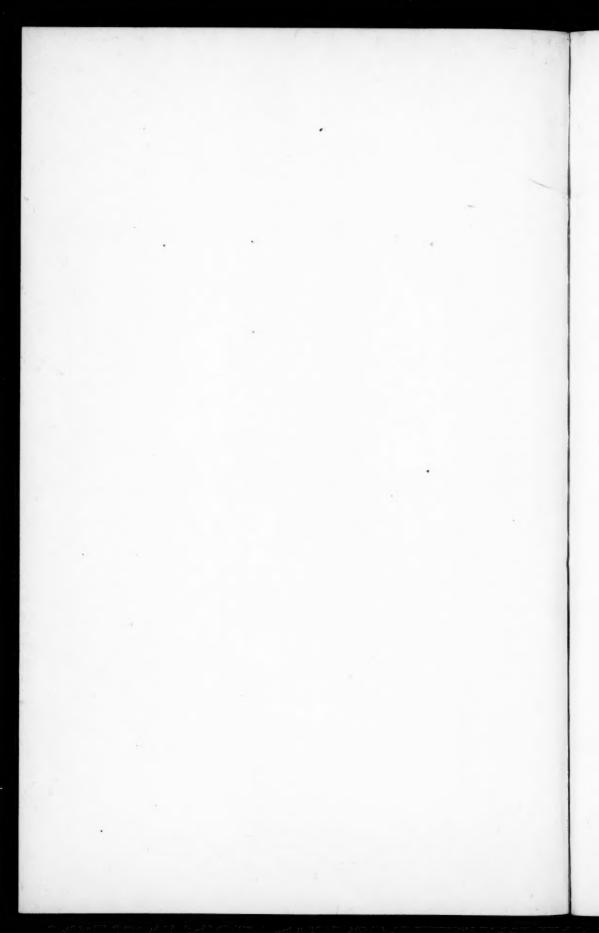
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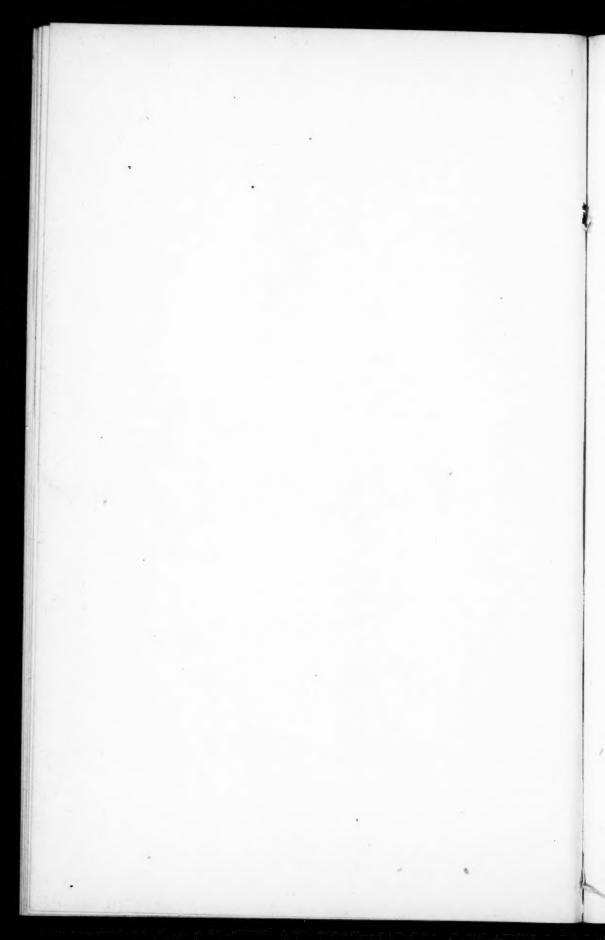
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TREATMENT OF FRACTURES OF THE LOWER END OF THE HUMERUS AND OF THE BASE OF THE RADIUS.¹

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As a preliminary to the discussion of the topics which have been assigned me by the Committee on Business it is proper to state that there will be found in my paper no new ideas, no new anatomical or pathological facts. It simply gives my personal views on certain problems in clinical surgery.

The frequency of fractures at the lower end of the humerus and at the base of the radius, and the necessity of maintaining functional integrity of the joints of the upper extremity make the consideration of such injuries of primary importance. The desirability of an accepted and usually practiced method of treatment for these fractures will be unquestioned; while the value of establishing such rules of practice is fully recognized by all interested in surgical jurisprudence.

The great diversity of opinion exhibited by the members of this Association last year, when the subject of elbow injuries was introduced by Dr. L. A. Stimson, was a revelation to me. I had, up to that time, believed that my own views, derived from the study of surgical literature and clinical cases, were not very different from those of other surgeons. Hence, I was somewhat unprepared for the remarks of many of the speakers on that occasion.

A pretty thorough examination of the text-books in the hands of the practitioners and students of this country and an investigation of some of the writings of foreign surgeons have led me to believe that much bad surgery is taught and practiced. This state of affairs must be due to ignorance of recent advances

¹Read before the American Surgical Association, at Boston, May 31, 1892.

in surgical pathology or to an indisposition to accept statements and methods of treatment which appear to me to appeal very strongly to surgical experience and intelligence. As an illustration, I quote from a recent work of M. Armand Després, published in 1890. The author, in speaking of fractures at the lower end of the radius, says: "I am of Nelaton's opinion that the reduction is not necessary; the apparatus when well applied reduces the fracture by degrees and without pain." He, moreover, does not apply the splints until from twenty-four to thirty-six hours after the injury, but uses up to that time warm fomentations or cataplasms. Such a method of treatment seems to me so totally opposed to surgical principles and the advice of such a dangerous character to give students that any discussion which will neutralize the effect of this author's words cannot be without value.

Again, I find in Dr. Henry R. Wharton's valuable treatise on Minor Surgery and Bandaging, published in 1801,2 the direction given that, before applying any splint in fractures of the lower end of the humerus, "it is well in many cases to apply over the region of the fracture several folds of lint saturated with lead water and laudanum, and to cover this dressing with waxpaper or rubber tissue, to diminish as far as possible the swelling which is very marked after these injuries." My own belief is very strong that such dressing is not only useless but harmful; because the application of these poultices over the injured limb often gives rise to the occurrence of cutaneous vesication in the inflamed region. Evaporation of the lotion is prevented by the rubber tissue or wax paper, and the encouragement of serous exudate beneath the cuticle is not infrequently followed by large blebs. Such applications are never required in fractures, since the swelling and œdema, due to the aseptic traumatic inflammation, rapidly subside if the fragments are properly adjusted and kept at rest. I have a continual struggle with young hospital residents to prevent their following this pernicious advice, which appears to be taught by more than one lecturer. In cases where the swelling and cedema will not subside by coaptation of the

¹ Treatise on Fractures, translated by Dr. E. P. Hurd, p. 4.

² P. 325.

fragments and rest, more active surgical interference than applications of lead water and laudanum is required.

The unfortunate tendency to use complicated facture dressings, which obtained in the early history of surgery, still remains to be overthrown by the continued advocacy of mechanical simplicity. Most of these appliances appear to have been invented by those more interested in the construction of ma-

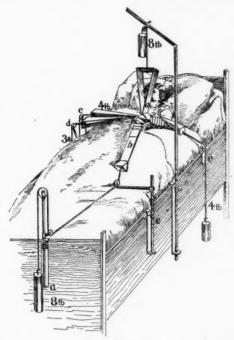


Fig. 1. Fractura radii loco-classico.

Durch a wird das untere Ende des Vorderarmes dorsalwärts geleitet, durch c wird das obere Ende des Vorderarms fixirt, durch b wird die Hand und das untere Fragment volarwärts geleitet.

chinery than in a simple solution of the mechanical problems presented by osseous injuries. The application of these complicated dressings is nearly always expensive and uncomfortable to the patient, confusing to the average practitioner, and unintelligible to the student. Their use, moreover, tends to direct the attention of the surgeon to the kind of apparatus rather than to the conditions presented by the special injury under his care.

No better illustration of this tendency to devise unnecessary appliances for fractures is needed than this drawing of an apparatus of Prof. Bardenheuer for fractures of the lower end of the radius. You see the patient confined to bed, on the frame work of which are fastened six pulleys, through which five cords with weights make traction on as many different parts of the arm and hand. You will be surprised, perhaps, when I tell you that this device of the inquisition is described in his book published in Stuttgart in 18001. The other splints and dressings represented and advocated by this writer in like manner strike the practical surgeon with amazement. If it were not for the indisputable evidence of the title page, the book might be regarded as the work of a mediæval author. Think of a man with fracture of the lower end of the radius, which usually needs no splint and often need not keep him from business for one hour, being confined to bed with five weights pulling on his unhappy arm.

These considerations make me believe that a discussion by this representative body of the treatment of some of the common fractures of the upper limb will not be valueless. Simplicity in dressings, comfort to the patient and very early restoration of function are the demands made by the public when fractures require treatment. I believe these demands can and will be met in nearly all fractures, if surgeons will but use their intelligence, instead of blindly following the advocates of special splints; and if systematic authors will resist the temptation of describing and cataloguing every device that has been employed for these lesions.

Believing that the methods which I have been led to adopt are founded upon good anatomical and pathological reasoning, I cannot but think that a trial of the simple dressings proposed in this paper will lead to a recognition of their value. I venture to hope that their adoption by surgeons generally will change the opinion, apparently existing in many minds, that good results after fractures at the elbow and wrist are rather the exception. I adhere strongly to the statement which I made at last year's meeting—that I approach ordinary fractures at the lower end of the humerus and of the base of the radius with a feeling that I

¹Leitfaden der Behandlung von Fracturen und Luxationen, p. 96.

shall almost certainly obtain results satisfactory to myself as well as to the patient.

It is proper to explain what is meant here by the term "uncomplicated" fractures, since a proper understanding of the word as used in this communication is essential to the subsequent discussion. I mean fractures in which there is no dislocation of the joint, no rupture of large vessels, no laceration of the nerve trunks and no unusual contusion or laceration of surrounding tissues. In many of the cases which I am considering there is involvement of the adjacent joint by lines of fracture, splitting the lower fragment. I consider these cases uncomplicated, if the fractures are closed ones and if the comminution of the lower fragments is not extraordinarily great. I am aware that this involvement of the joint by fissures is technically a complication; but it is so common in the fractures which I desire to bring before you, and so unimportant so long as the injury is free from septic contamination, that I have used the word uncomplicated in connection with it.

In order to facilitate discussion I shall at once state my opinions and the methods of practice which I have come to adopt in these injuries. They are as follows:

HUMERUS.

I. In the treatment of fractures of the lower end of the humerus the divergent angle between the axes of the arm and forearm must be preserved; and hence dressings which interfere with the normal difference in level of the radius and ulna are not permissible.

2. Fractures of the lower end of the humerus of ordinary severity are, as a rule, more successfully treated in the extended than in the flexed position; because the carrying function is less liable to be impaired.

3. Passive motion at an early date is harmful, and should be deferred until union has occurred and the dressings have been finally removed.

4. Good results as to anatomical conformation and as to motion are generally to be expected and can usually be obtained.

5. Recent fractures in which satisfactory coaptation is not obtainable under anæsthesia may with propriety be subjected to exploratory aseptic incisions. Old fractures in which deformity and impairment of function are marked may, within certain limitations, be subjected to refracture or osteotomy for the relief of these conditions.

RADIUS.

- Fractures of the lower end of the radius vary comparatively little in their general characteristics, because but one form is usual.
- 2. Muscular action has little or nothing to do with producing or maintaining the deformity.
- 3. Immediate reduction of the fragments is the essential of treatment.
- 4. Many of the splints devised for the treatment of this fracture have been constructed in ignorance of the pathology of the condition.
- 5. The ordinary fracture of the lower end of the radius usually requires no splint, and should be dressed with a wristlet of adhesive plaster or bandage.
- 6. When a splint is required a narrow short dorsal splint fixing the wrist is all that is necessary.
- 7. The method of dressing here advocated is the best, because it, by avoiding cumbersome appliances, annoys the patient as little as possible, and it permits free voluntary movements of all of the finger joints.
 - 8. Passive motion is unnecessary until union has occurred and the dressings have been finally removed.
 - 9. Good use of the wrist and fingers is early obtained and the anatomical conformation is restored as well as, and perhaps better than, by other more complicated dressings.
 - 10. Fractures which have been improperly treated by omission of immediate reduction, may, with considerable success, be subjected to refracture even after the lapse of several months. At later periods readjustment may be possible only by osteotomy, which is a legitimate means of treatment.

FRACTURES OF THE HUMERUS.

Surgeons now generally recognize the necessity of maintaining the so-called carrying function of the upper extremity, and methods of treatment which tend to alter the relations of the



Fig. 2.

Normal angle of bones of forearm. (Allis).

axes of the arm and forearm should be discarded. The reasons assigned by Allis¹ for the frequent occurrence of "gun stock" deformity after fracture of the lower end of the humerus



Fig. 3.
Differing planes of the radius and ulna. (Allis).

are, I think, correct. The commonly employed splints, and the displacing influence of the ordinary sling tend to bring the ulna and radius on the same level, and thereby destroy the divergent

¹Annals of Anatomical and Surgical Society, Brooklyn, August, 1880.

angle of the bones at the elbow or create an angle in the opposite direction. It is asserted that the ascent of the internal condyle one-quarter of an inch will destroy the normal angular deflection at the elbow.¹ The direction of line of fracture and the point at which it enters the joint have, it must be remembered, a great influence on the possible occurrence of change in the axes of the arm and forearm. The principle is the same as that utilized in condyloid and supracondyloid osteotomy in knock-knee.

Packard makes the important assertion² that the plane of the articular surface of the humerus corresponds with the oblique



Fig. 4.

Relations of articulating portions of radius and ulna to humerus, in fracture of internal condyle; showing ease with which ulna and broken condyle can be forced up by splints and bandage, or sling, thus destroying carrying function of the arm.

furrow of the skin on the anterior part of the joint. We know, moreover, that when the elbow is flexed at a right angle the axes of the arm and forearm coincide. For this reason, it is much more difficult to be sure that the fragments are in the proper position, to insure integrity of the angular deflection, when the arm is about to be dressed in the flexed position, than when the surgeon compares the two arms and replaces the fragments while the injured limb is extended.

In my experience the angle of deviation is greater in muscular persons than in those of opposite development. In women and children it sometimes scarcely exists. It is well to remem-

¹Stimson, Fractures and Dislocations, p. 403.

²Internat. Ency. Surg. Vol. iv. p. 144.

ber that Pilcher says¹ that there is a variation in the degree of this angular deviation in normal arms of the same individual. He found as much as five and one-half degrees difference in the two arms of one of the children whom he measured. In his opinion muscular action, particularly the action of the triceps, has much to do with the creation of the angular distortion which often occurs when elbow fractures are treated in the flexed position.

I see no objection to the surgeon cutting down upon the displaced fragments when it is impossible to properly coapt the irregular surfaces. An aseptic exploration of a closed fracture is better surgery than the conservatism which gives a rigid and distorted elbow.



Fig. 5.

Diagram showing relation of ulna to lower end of humerus with the line of fracture entering the joint at different points. Some lines of fracture permit slipping up of the internal condyle under injudicious use of splints; other lines of fracture do not. (Allis.)

A surgeon who fully realizes the probability of impairment of the carrying function in these fractures can without doubt treat them equally well in either the flexed or the extended position. Accurate readjustment of the fragments and provision for careful maintenance of the coaptation will usually produce good results. In the flexed position plastic dressings, made with gypsum and similar agents, are far preferable to angular splints of wood, metal or other rigid material. The former are made to accurately conform to the limb immediately after the surgeon has reduced the fracture; hence there is not much opportunity for subsequent displacement to produce a change in the normal outline. If rigid splints are applied, however, the movable fragments are liable to be forced into undesirable relations by the bandage and

¹Annals of Anatomical and Surgical Society, Brooklyn, Sept., 1880, p. 367.

sling. This occurrence is possible for many days after the fractured portions of the humerus have been skillfully adjusted by the surgeon.

Practitioners who see comparatively few cases are, however, less liable than surgeons to appreciate the probability of a "gun-stock" deformity. In the flexed position of the elbow, moreover, the deviation of the axes of the arm and forearm does not exist; hence in this position a slight displacement of the plane of the articular surface of the humerus is easily overlooked. For these reasons the extended position is the better for general adoption, since the angularity of the unbroken arm is then noticeable, and any interference with the normal deviation is very apparent.

If the sentiment of the profession was in favor of usually treating these fractures in the extended position there would be



Fig. 6.
Deviating angular splints for fractures at the lower end of the humerus.

very many less deformed arms. A specialist will vary his methods to suit each case; but for general use is needed a rule that will lead the practitioner of average experience and intelligence to get good results in the greatest possible number of cases. The extended position will, I believe, secure this result. By "extended position" I mean that position in which the elbow is extended almost, but not quite, fully. The forearm and hand are to be supine. Complete extension would be exceedingly uncomfortable to the patient, and is not what is meant.

Dr. Lane gave in his paper in the Transactions of last year a very interesting account of the views of various surgical authorities on this question.

I have for a number of years used a narrow, light, wooden splint, long enough to extend from the upper part of the arm to the wrist, having a divergent angle at the elbow. I usually make this splint out of a thin board at the time of dressing the fracture, using the sound arm as a guide. A little padding of

cotton or oakum is laid in the bend of the elbow, to fill the hollow present there, because the joint is not fully extended. This padding is not intended to make pressure on the fragments. In cases where there is too much swelling to permit extension of the arm I apply an anterior obtuse angle splint or a posterior obtuse angle trough for a few days; but I soon change it for the anterior deviating splint above described. This method of treating fractures above the elbow has been fully discussed by me elsewhere.¹

In supracondyle fractures, however, I have usually employed the flexed position, maintained by an anterior right angle splint or a posterior right angle trough. The reading and investigation necessitated by the preparation of this paper have, however, caused me to incline towards the adoption of the extended position for supracondyloid as well as condyloid fractures. The relaxation of the triceps so induced seems to me to be desirable especially as the supination of the forearm and hand relaxes the biceps, one of the main opponents of the triceps. This position, therefore, relaxes two of the strong factors tending to produce the backward displacement, which is so much feared by many in supracondyloid fractures or epiphyseal descriptions.

Allis² Pilcher³ Verneuil⁴ Gibney, Powers⁵ and others are correct when they deprecate the early employment of passive motion in fractures about the elbow and other joints. Stimson put it very ably when he says,⁶ " that the ankylophobia of the surgeon is more dangerous to the patient than the traumatism." Orthopædic surgeons give the same evidence in the study of the collateral topic of rest in joint diseases. Phelps³ has seen normal joints immobilized for ten, twelve and eighteen months without ankylosis occurring in either the normal or the inflamed articulations. Experimental study on dogs has shown the same fact.

¹ Modern Surgery, Lea Bros. & Co., Phila., 1890. Pp. 399.

²Annals of Anatomical and Surgical Society, Brooklyn, Aug., 1880, p. 306.

³Idem, Sept., 1880, p. 369.

^{*}Quoted by Pilcher.

⁵Medical Record, New York, Dec. 22, 1888.

⁶Trans. Amer. Surg. Assoc., 1891, p. 269.

⁷Proceedings Phila. County Med. Soc'y, 1891, p. 439.

In 1885 I stated in an article on "False Doctrine in the Treatment of Fractures" that passive motion should not be commenced until union of a fracture is pretty well accomplished. My present belief is that it is best to delay it until union has occurred and the retaining dressings have been finally removed. If begun earlier it is very likely to be harmful by giving pain, causing arthritis, or displacing the fragments.

The advice of Hamilton urging early passive motion in elbow fractures is probably responsible for many stiff elbows. He says2 concerning fractures of the base of the condyles, "At a very early date, so early, indeed, as the seventh or eighth day, the splint should be removed, and while the fragments are steadied, the joint should be subjected to gentle passive motion. This practice should be repeated as often as every second or third day, in order to prevent, as far as possible, ankylosis." Could any advice be more erroneous or dangerous than this; and yet it has appeared in successive editions, and is repeated as authoritative in many quarters? Dr. Stephen Smith fortunately adds an editorial note in the edition of Hamilton just quoted, saying that many surgeons believe early passive motion in this fracture to be detrimental and never to be practiced. It is to be hoped that the wisdom of this note will correct the monumental error of the original text.

It is interesting to note that Dr. L. C. Lane⁸ believes that the flexed position of the elbow during treatment of fractures of the region under consideration is more favorable to ankylosis than the extended; because there is more room for neoplastic deposits in the anterior muscular and fibrous structures, which are plicated during flexion.

Deformity and impaired mobility may at times be improved by refracture or osteotomy done with careful asepsis. Cases for such radical measures must, however, be judiciously chosen.

Correspondence with the Fellows of this Association, the Members of the New York Surgical Society and the Fellows of the Philadelphia Academy of Surgery, shows me that I am cor-

¹Journal American Medical Association, May 30, 1885, p. \$89.

²Treatise on Fractures and Dislocations, Eighth Edition, edited by Stephen Smith, 1891, p. 244.

³Trans. Amer. Surg. Association, 1891, p. 413.

rect in the opinion that such uncomplicated fractures of the lower end of the humerus as I am discussing, usually recover, if judiciously treated, with little or no deformity and with good motion. My experience then is simply corroborative of that of other surgeons.

Letters sent to these surgeons elicited eighty-eight replies:

Letters sent to these surgeons elicited eighty-eight replies	
I.	
a. The number who preferred the flexed position in treatment were 65	5
b. The number who preferred the extended position in treatment	
were	
c. The number who employed both positions in treatment were.	•
d. The number who gave no definite answer to the query was	1
Total	3
a. The number who preferred the flexed position because it was	
thought to insure better coaptation were	7
b. The number who preferred the flexed position because there was	
a fear of anchylosis were	3
c. The number who preferred the flexed position because it was	
	6
d. The number who gave no definite reason or answer 4	4
Total	5
III.	
a. The number who began passive motion within four weeks were 64	
b. The number who began passive motion after four weeks were.	
c. The number who did not use passive motion at all were 15	~
d. The number who gave no definite answer to the query were	2
Total	3
a. The number who usually expect to obtain good use of the joint	
were	0
b. The number who are doubtful about obtaining use of the joint	
were	3
Total	3
In studying these tables it must be remembered that the	2
manner in which some of the correspondents replied made it a	

little difficult for me to determine under which heading they

should be classed. I have endeavored to classify the replies correctly by studying the apparent feeling of the writer as well as his phraseology. In some cases several reasons were given for the choice of the flexed position; in these I tabulated the one to which most importance seemed to be attached. The views of each surgeon will be found in the detailed tables at the end of this paper. The small letters affixed to the replies indicate under what heading they have been put in this abstract. I am rather astonished at the number who fear ankylosis; and am interested in the admission of some that routine is the only reason they have for adopting certain lines of treatment. The number who cling to passive motion in the early weeks is larger than I anticipated. Those who begin passive motion after four weeks might with propriety be classified with those who attach no importance to it, since union of the fracture has become quite firm in four weeks.

FRACTURES OF THE RADIUS.

It is unfortunate that the name of Colles is still associated with fractures of the base of the radius. Such personal nomenclature is always objectionable; and is especially so here, since Colles placed the seat of lesion at a higher point than that at which fractures of the base of the radius usually occur.

Fractures of the lower end of the radius vary very little in their essential clinical details. The degree of displacement, comminution, or impaction is not always the same; but through all the variations, due to the character and continuance of the vulnerating force, the surgeon sees the same essential lesion, situated at nearly the same point of the bone. The treatment, too, needs little variation, and consists in immediate forcible reduction.

The usual line of fracture is situated at from one-third to three-quarters of an inch above the articular surface of the bone, and is generally more or less transverse in direction, though some tendency to lateral or antero-posterior obliquity is not infrequent. Displacement of the lower fragment backward upon the lower end of the upper fragment is the ordinary deformity, and is due to the fracturing force, not to muscular contraction. Some impaction is not unusual from driving of the dorsal wall

of the upper into the cancellated structure of the lower fragment, and actual loss of substance from crushing of the bony tissue is not infrequent. When impaction does not exist, entanglement of the fragments by interlocking of the irregular surfaces is very common. At times there is no displacement; at others it occurs only at the radial, and not at the ulnar side of the lower fragment, which then is tilted obliquely backwards. The styloid process of the radius is carried upward and backward by this displacement, and therefore the radial styloid process is often as high as, or even higher (that is, further from the hand) than the ulnar styloid process. This angular displacement tends to throw the articular surface with the attached carpus upward, backward and to the radial side, and produces the peculiar deformity so recognizable. Sometimes the integument over



Profile view of Dr. Westbrook's specimen of fracture of lower end of radius.

Annals of Anatomy and Surgery. Vol. III. (1881), p. 114.

the ulnar head is torn asunder by this radial displacement of the hand, and the ulna may even protrude through the laceration. Such a wound by no means implies an open or compound fracture of the radius, for frequently the wound has no communication with the fractured surfaces.

The fracture just described, with or without comminution of the inferior fragment, is the one usually seen. Associated fracture of the lower end of the ulna, of the ulnar styloid process, or synchronous rupture of the radio-ulnar ligaments; and epiphyseal fracture may, however, occur. Fracture of the lower end of the radius with forward displacement is very rare.

Fractures identical in pathology and deformity with those found clinically can readily be produced in the surgical laboratory by sudden hyperextension of the hand caused by heavy blows.

As there is no opportunity for living muscles to assist in the production or maintenance of deformity here it is reasonable to suppose that muscular action has little influence upon the fracture in patients. The tonic contraction of the muscles of the forearm may be an agent in holding the fragments in their abnormal position, when there is simple entanglement of the rough surfaces without true impaction, and the tendons may similarly cause the normal relations to be maintained after reduction by the surgeon. Further than this, muscular influences are unimportant, if my experience has taught me correctly. The conditions in a transverse fracture of the broad base of the



Fig. 8.

Deformity in the usual fracture of lower end of radius. Taken from cast made before reduction and treatment.

radius are very different from those in an oblique fracture of the shaft of this or other long bone surrounded by muscular bellies. The statement that there is a great tendency to displacement by muscular action after reduction has been accomplished is unconfirmed by clinical observation, unless there be unusual comminution of the lower fragment. When the radius is broken two to two and a half inches above the joint, or in the middle third of the shaft, the conditions are probably different; but I am not considering such fractures at this time.

It seems impossible that any surgeon would think of advocating the omission of immediate or complete reduction of the lower fragment in this fracture, in which non-union is practically unknown. Yet, as I have stated in the earlier paragraphs

¹Holmes' System of Surgery, Am. Ed. by Packard, 1881, vol. i, p. 864.

of this communication, M. Després does so. Equally astonishing to me is the advice of Dr. Wyeth¹ that "in aged patients, who have considerable impaction, it is not advisable to break up the impaction." Mr. Southam² speaks of cases in which the deformity cannot be made to disappear, and another writer³ says that the impaction should be undone if possible implying that impossibility of reduction is not very unusual. About ten years ago I treated a woman of perhaps seventy year⁵ of age who had fallen from a roof to the ground, breaking both radii with great displacement. My duty would not have been done, in my opinion, if I had not used the same force in overcoming the interlocking of the fragments in this old woman as I would have employed in a young person. She rapidly recovered with



Fig 9.

Deformity produced by an experimental fracture of the lower end of the radius in a cadaver preserved by zinc chloride. A heavy blow was struck on palm, while hand was fully extended and forearm vertically placed with elbow on table.

perfect use of wrists and fingers, though distortion at the wrist was marked, because of the probable comminution of the lower fragment and the fact that the woman was imbecile and constantly pulled off the splints and dressings.

That reduction is at times impossible may perhaps be true, but I have never seen an instance which the power of my two hands, aided by leverage across my knee, could not reduce under anæsthesia. Reduction is to be accomplished by force, not by gentle pressure and manipulation, as some would have us believe. I usually accomplish it by extension and counter extension applied to hand and forearm, aided by sudden flexion of the wrist with simultaneous pressure on the dorsum of the lower fragment. This manœuvre is repeated, if necessary, until I feel

¹Text Book on Surgery, 1888, p. 296.

²Treves' Manual of Surgery, Vol. II., p. 54.

³Druitt's Modern Surgery, edited by Stanley Boyd. Twelfth Am. Ed. p. 256.

no ledge of bone at the seat of fracture when I carry my fore finger or thumb along the dorsal surface of the lower third of the radius. The reduction is so quickly done that anæsthesia is generally omitted. In recent cases this manipulation is generally sufficient, but in unreduced cases of several weeks' duration, and sometimes in recent cases, I have been obliged to bend the limb over my knee so as to break up the connection between the misplaced fragments. Very firm impaction, entanglement of the fragments in the tendons, or dorsal periosteal bands may require the surgeon to bend the hand and attached lower fragments strongly backward, in order to release the interlocking, before making traction, flexion and pressure. This manipulation is, however, seldom necessary.

It has been asserted that the long supinator or square pronator opposes reduction of the deformity; this is undoubtedly a fallacy in so far as real obstacle is offered by these muscles. Mr. Howard Marsh¹ makes the extraordinary statement "Should reduction not be accomplished on the first trial, the attempt should be repeated a week later when the fragments may have become somewhat loosened on each other, and when, swelling having subsided, manipulation can be more accurately directed."

Dr. John Ashhurst in a publication issued several weeks ago² makes statements equally misleading and, in my opinion, exceedingly dangerous. The deservedly high reputation of Professor Ashhurst will cause many practitioners to follow his words implicitly. The result will, I fear, be the production of many unnecessarily stiff wrists and fingers after fracture of the base of the radius. He says, "The important part of the treatment is, of course, to keep the fragments in their proper position. If you bear in mind the mode in which the fracture occurs, you can at once see how the compresses which we use should be applied to counteract the deformity." Two compresses, a dorsal and a palmar, and a Bond's splint, are used by Dr. Ashhurst, who continues, "When the compresses are brought together, the bones are necessarily pushed into position. Even if you cannot

¹Heath's Dictionary of Pratical Surgery, Vol. II., p. 293.

²International Clinics, Vol. I., p. 201, Philadelphia, 1892.

accomplish this at once, you will find that, by careful dressing, in a few days the deformity will disappear."

It is possible that this method of dealing with a fracture of the lower end of the radius might be admissible and do well at the hands of this eminent surgeon in the case he was discussing, in which the lower fragment may have been greatly comminuted. I feel very sure, however, that the omission to call attention to the necessity of immediate and complete reduction, as a first step in all these fractures is a grave error, and that the apparent or intentional direction to rely upon the compresses to overcome the deformity is most unwise.

Further on in his clinical lecture, which was delivered at the University Hospital, Dr. Ashhurst states, "I have seen sloughing occur from the pressure of the compresses when this precaution has not been adopted." The precaution to which he has reference is the use of "lead-water and laudanum or some other soothing fomentation." in the early stages of the treatment, or when there has been much bruising. Is it not possible that the sloughing was the result of injurious pressure by the compresses rather than the omission of local fomentation? The use of the latter, as I have previously said, in speaking of fractures of the elbow, is always undesirable and useless.

In a paper¹ read before the Philadelphia Academy of Surgery about eighteen months ago I mentioned that I had repeatedly been obliged to refracture and reduce fractures of the lower end of the radius after treatment in splints by other physicians. In a series of forty-eight cases reported at that time six cases came to me with the lower fragment still unreduced, though a splint had been applied in each instance. This personal experience can be duplicated, doubtless, by nearly every surgeon who sees many fractures in hospital or consultation practice; and is due to the fact that teachers and text-books do not sufficiently emphasize the necessity for reduction. The profession should be shown that the treatment of fractures of the lower end of the radius is reduction, and not a splint, either with or without compresses.

The ignorance of the true pathology of this fracture was formerly so great that many ridiculous splints have been devised

¹Medical News, Dec. 13, 1890, p. 615.

for its treatment. Many were constructed on the theory that the extensor muscles of the thumb were a cause of the deformity; and not a few were employed that failed to recognize the curvature of the palmar surface of the lower portion of the radius. These errors are intelligible and were excusable; but I fail to appreciate the acumen of the authors who still figure these useless antiquities in their text books or of the surgeons who advocate and use them.

After reduction the ordinary fracture of the inferior extremity of the radius rarely requires such rigid support as a splint, because the transverse character of the fracture gives a broad rough surface of contact, and the extensor tendons running over the dorsal surface of the bone act as tense straps to hold down the lower fragment.



Fig. 10.

Fracture of the lower end of the radius dressed with a wrislet of adhesive plaster.

If there is much comminution or if the patient is a careless man or a romping boy, it may be wise to use a short and narrow dorsal splint upon the back of the wrist. It may be made of a piece of cigar box, a strip of metal, or consist of two or three whalebones, such as are used in ladies' dress waists. It should only extend from the middle of the metacarpal bones to the junction of the middle and lower thirds of the forearm, being, therefore, about six inches long. Its width need not be over one inch. It can be held in place by adhesive plaster or a bandage encircling the limb. This dressing should not be employed longer than ten days or two weeks at the most during all of which time the patient should use his fingers as freely as pain and swelling will permit.

In the great majority of cases this dressing is unnecessary, and a simple roller bandage, or a wristlet made of two or three superimposed strips of rubber adhesive plaster, is all that is required. It makes no difference whether the hand is maintained in the prone or supine position during treatment. The patient holds it first in one and then in the other, varying the position at pleasure. This simple method of treating the fracture gives the patient the necessary freedom in moving his fingers, from the instant the fracture is set, does not prevent his wearing a sleeve, allows inspection of the parts, and is inconspicuous, light, clean and efficient. If the surgeon is unwilling to use either of these forms of dressing the moulded metal splint devised by Levis for application to the palmar aspect of the forearm and hand is the best of the special splints. The arched or curved nature of the palmar surface of the lower third of the radius prohibits a straight splint being applied there; but on the dorsal surface a straight splint may be used.

Passive motion should not be employed in fractures of the lower end of the radius, for the reasons that I have given in speaking of humeral fractures. It is not needed for the wrist joint; and the finger joints are being moved constantly by the patient during the entire treatment, except when pain or swelling makes this impracticable. Under such circumstances passive motion would not be desirable, if practicable

When, in ten days or two weeks, sufficient union has occurred, for the dressings to be removed, soaking in warm water, friction with liniments and passive motion are useful to hasten the restoration of function. This is usually very little impaired except in rheumatic subjects, and in cases where great associated injury to the soft parts has occurred.

The dressings employed may usually be discarded in ten days or two weeks in ordinary cases, and in three or four weeks in comminuted fractures. Long retention of the appliances is unnecessary, and even deleterious when splints are employed, because of the greater tendency to stiffness induced.

In properly treated cases of ordinary severity, perfect use of wrist and fingers is obtained within a few weeks after injury. Patients can often write a little and use the hand for dressing themselves within ten days or two weeks. This facility varies with the amount of comminution and inflammation. Persons of rheumatic or gouty tendencies are probably more liable to stiff-

ness of the fingers and wrist than others. Fractures in other regions present the same complication in such individuals. Much of the rigidity of wrist and fingers attributed to rheumatic and gouty causes, or to the senility of the patient, I believe to be due to imperfect reduction of the fragments and to unscientific and unwise treatment. I have not recognized the stiffness and rigidity after this fracture in the aged, which some authors mention with emphasis. I expect the same early and perfect freedom of motion in them as in the young, except in so far as the aged are more liable to rheumatism and gout.

It is the opinion of Bryant¹ that "after this form of fracture the wrist-joint rarely recovers its normal movement." My belief is that after this fracture the wrist-joint usually, but not always, perfectly recovers its normal movement, provided that reduction has been complete at the outset of the treatment and the case well managed. Moderate deformity, due to shortening of the radius, alteration in the plane of its articular surface and abnormal prominence of the head of the ulna, is not unusual, but is unimportant if motion is perfect, as it generally is.

Mears² advocates early passive motion, and recommends that after the removal of the splints, at the end of five or six weeks, the manipulations should be continued to restore function and "remove the rigidity of the articulation which inevitably follows fracture at this point, and enable the patent to regain, to a great degree, if not completely the function of flexion, extension, supination and pronation." This seems to indicate his belief that final restoration of motion is possible after a long interval. My experience teaches me that it is usual almost as early as the date at which Dr. Mears discards the splints.

The statement of Stimson³ in discussing this topic is, "This rigidity of the fingers is due in part to their prolonged immobilization and in part to inflammation within the sheaths of their tendons in the forearm." This is probably correct and indicates the harmfulness of many methods of treatment in which the fingers

[,] Practice of Surgery, 4th American Edition, 1885, p. 880.

²Practical Surgery, 1885, p. 206.

³Fractures and Dislocations, p. 460.

are confined for from four to six weeks. Under prognosis, Hamilton¹ gives the essence of the matter in these words, "In cases treated by myself, where I have exercised great care in reducing the fragments thoroughly, and where the bandages and splints have not been applied too tightly, nor kept on too long, deformity to any considerable extent is the exception, and the stiffness is soon dissipated."

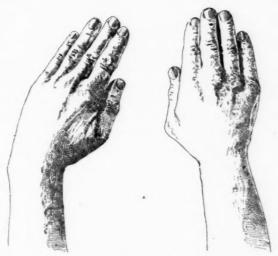


FIG. II.

Plaster casts showing abnormal voluntary abduction of hand after fracture of the lower end of the left radius No deformity and no loss of mobility of wrist or fingers exists. The figure of the right or uninjured forearm shows fullest abduction which is possible in the normal wrist.

If great comminution or crushing has been incidental to the fracture, perfect restoration of the anatomical contour of the wrist may be impossible. Recurrence of deformity may take place after reduction has been well accomplished, if there be unusual comminution of bone and laceration of ligaments. Such cases show preternatural mobility and marked crepitus as symptoms. These cases, and even those of less severity, quite often present, after union and recovery of normal motion, an undue prominence of the ulnar head and a deflection of the hand to the

¹Fractures and Dislocations, Edition of 1891, edited by Dr. Stephen Smith, p. 284.

radial side. This deformity is due to shortening of the radius, the result of imperfect coaptation of fragments, absorption of small particles of the bone separated by crushing, change in the plane of the articular surface of the radius, or interference in young patients with the normal growth at the epiphyseal cartilage. This alteration in the anatomical conditions of the lower end of the radius may make it possible for the patient to voluntarily incline or abduct the hand to the radial side very much more than normal.

In March, 1882, I presented to the Philadelphia County Medical Society¹ several cases of fracture of the lower end of the radius. One was a man of sixty years who, after mounting a high bicycle, had fallen with the machine down a high bank.

He fractured the left radius and two ribs. The cure was so perfect that many members of the society could not tell which had been the broken arm. He was by no means young, but never had any stiffness, such as is attributed by some writers to age. He has, however, to this day much unnatural latitude of motion when he deflects the hand to the radial side, as the plaster casts of his forearms and hands show.

When the fragments have not been reduced and vicious union therefore results, the surgeon should, as in mal-union of fractures in other regions, resort to re-fracture. This can be done by bending the limb across the operator's knee, while the patient is under anæsthesia; aided, perhaps, by hyper-extension of the hand and wrist. I have successfully done this as late as eight weeks after injury and have seen it done five and a half months subsequent to the original traumatism. The correction of deformity will not be as perfect as in cases treated properly from the beginning; nor should such good results, as to complete and early mobility of fingers and wrist, be expected. Dr. Richard H. Harte² has reported cases in which he did osteotomy to overcome the viscous union. I am inclined to believe that refracture would have been possible in his cases, as they were seen early. Osteotomy is undoubtedly, however, the proper treatment when refracture requires force liable to do serious damage to the soft parts.

¹Proceedings 1881-82, p. 159.

²University Medical Magazine, 1887.

An aseptic or antiseptic osteotomy gives no real risks and allows the surgeon to see the bone and choose the exact line of his osseous incision.

Questions similar to those mentioned in the discussion of fractures of the humerus were sent to the Fellows of the American Surgical Association, the Members of the New York Surgical Society and the Fellows of the Philadelphia Academy of Surgery.

I.

This correspondence elicited replies from 88. a. The number who frequently treat fractures of the lower end of the radius without any form of splint were 9 b. The number who always use some form of splint were 78 c. The number who made no definite answer to this particular query a. The number who use passive motion within four weeks were . 68 b. The number who use passive motion after four weeks were . . 3 c. The number who do not use passive motion at all were 15 d. The number who made no answer to this query were · · · . . 2 III. a. The number who usually expect to obtain good use of the wrist b. The number who usually expect to obtain good use of the wrist and fingers except in aged, rheumatic or gouty patients were . 13 c. The number doubtful about obtaining good results were 4 d. The number who made no definite answer to this query were . 2

The same conditions attach to the compilation of this table as are mentioned after the similar table relative to fracture of the humerus on page 13.

Surgeon.	Do you treat fractures of lower end of humerus of ordi- nary severity in flexed or ex- tended position?	Why?	When do you begin passive motion ?	Do you usually expect to obtain good use of joint?
r. B. A. Watson.	Extended.	More easily retain- ed in proper position.	Fifth week in children, seventh in adults	Yes.
2. T. R. Neilson.	Flexed.	Seems more favor- able for coapta- tion and is more com- fortable than extend- ed position.	Generally at end of first week.	Yes.
3. F. Lange.	Flexed.	For securing better apposition and useful position in case of stiffness.	Differs. Most- ly after 3 weeks.	Gradually.
4. C. H. Mastin.	Extended, I think Allis' method by all odds the proper one.	Because the bones are kept in exact position.	After consolidation is perfect.	Always.
5. R, B, Bontecou.	Flexed.	The fragments are easily kept in posi- tion and it is more comfortable.	Third week.	Yes.
6. W. W. Van Arsdale.	Flexed at 80°,	Because, in case of callus formation in fossa, it is more important to be able to flex the arm than extend it.	At end of fourth week on removal of splints.	Limited.
7. J. E. Michael.	Flexed position.	Comfort and convenience of patient.	Second week, generally.	Usually good, sometimes per- fect.
8. B. F. Curtis.	Usually flexed —extended (for no days) in frac- tures which threaten loss of 'carrying point.'	No answer given. d	None. Active motion in 4 to 6 weeks.	Yes.
9. J. McCann .	Flexed.	More complete re- laxation of muscles of arm and forearm; natural position of limb at rest; better coaptation of frag- ments.	Not until all tenderness has disappeared from joint,	Good,

^{*} Indicates that the replies are not given in full.

What splint do you use tor the ordinary fracture of the lower end of the radius?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of wrist and fingers?
Colles' fracture, E. M. Moore's system.	Gives better results.	Don't usually employ it.	Yes.
Bonds'.	Carefully padded and with compresses it maintains good adjustment in majority of cases.	Generally at third dressing.	Yes, except those past middle life.
Two (volar and dorsal).		Depends upon the features of case.	Yes; sometimes after prolonged treatment.
The so-called Nelaton or pistol splint,	It preserves interose- ous space and, by over- coming the action of quadratus muscle, keeps the fragments in apposi- tion.	After bone is united.	My results have been uniformly successful. I have never had a deformity in any case after having used this method.
Any straight board for the palmar aspect, only extending to second pha- langeal articulation, with a roll in the palm and compresses under distal end of radius.	It is efficient and comfortable.	Third week,	Yes.
One single straight board to in, long, $\hat{\gamma}_{i}$ in, thick, wide as sound wrist; dorsally applied.	Because there is less interference with circula- tion than with any other method, less deformity and better results.	End of third week on removal of splint, a	Yes.
Flat splints, dorsal and palmar, after careful reduction; somet i mes Porter's wire splint.	Best by my experience and observation, as well as theoretically correct.	Third week.	Yes, and am very rarely disappointed.
Anterior splint, eibow to wrist; posterior splint, elbow to knuckles; both flat and stiff.		Active motion in fingers from first, and of wrist in 7 to 10 days.	Yes,
A splint slightly curved to fit contour of wrist and hand and of forearm.	It affords good support to fragments, fixes wrist, and allows motion in fingers.	Not until late, after union of fragments and disappearance of pain.	Good in almost every case unless bones are much comminuted.

Surgeon.	Do you treat fractures of lower end of humerus of ordi- nary severity in flexed or ex- tended position?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of joint,
10 R. H. M. Dawbarn,	Flexed.	In case of bad results (ankylosis) it is a better position.	Not until I think bony union is complete, say, 4 to 7 weeks.	Yes.
II. A. G. Gerster.	Extended.	Because reduction of fragments is se- cured easier in this than in flexed posi- tion.	Ten days to 3 weeks.*	Mostly,though not always.
12. H. A. Wilson.	Extended.	To prevent angular deformity.	Beginning of fourth week.	Yes, generally.
13. T. J. Dunott.	Usually pre- fer extended *	The complications are often different.	No regular time. d	Partial.
14. J. S. Wight,	Position of right angled flex- ion.	It gives the best possible reduction of the fragments if ankylosis occurs; it gives a useful limb. I have operated upon a large number of cases which have been treated in the extended position: By torcible flexion or by exsection.	In 2 or 3 days.	As a rule, I obtain good use of the joint.
15. Geo. R. Fowler.	Extended for the first 10 or 15 days.*	No answer given,	From 10 to 15 days.*	Yes.*
16. V. P. Gibney.	No answer given.	No answer given.	I would never begin passive motion.	By rejecting absolutely pas- sive motion I would expect to obtain a good use of the joint.
17. F. S. Dennis.	Depends upon line of fracture— if extended, weight and pulley, like Buck's extension to knee.	No answer given,	Two weeks.	Not always; depends on cir- cumstances.

What splint do you use for the ordinary fracture of the lower end of the radius?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of wrist and fingers?
I think the kind of splint very unimportant; the proper reduction, usually under ether, is the thing; after that is done my preference is for plaster of Paris both here and always for splinting.		After bony union is complete, say 4 to 6 weeks.	Yes.
Pilcher's wristlet, if there is no tendency to displacement; otherwise, a dorsal plaster of Paris splint.	The latter is moulded to extremity and is easily removed for examination.*	Insist on active movements of fingers from beginning; commence passive motion after consolidation.	I do.
Plaster of Paris in form of Levis splint.	Accurately adapted, and because Levis proved that position necessary.	In third week.	Expect good use of wrist and delayed good use of fingers.
Straight splint.	After coaptation, under ether, has given me better results.	No stated time.	Yes.
A trough splint made of wire cloth.	This splint supports the ulna and comes up in front and on the back of the forearm and the hand.*	In 2 or 3 days.	Yes.* a
No splint whatever. A simple bracelet of broad, adhesive plaster, with or without the use of a pad to support the ulna, according as the latter is displaced or not.	No other apparatus is needed; motion is not restricted.*	Usually not necessary. In 2 or 3 weeks the dressings are abandoned and active movements encouraged,	Invariably,
No answer given.	No answer given.	I would never be- gin passive motion.	No answer given.
Two lateral splints reaching to lower end of lower fragment.	No answer given.	Two weeks.	Yes.

Surgeon.	Do you treat fractures of the lower end of the humerus of or- dinary severity in flexed or ex- tended position?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of joint?
18. DeF. Willard.	Extended, as a rule; not invariably.	Less deformity.	Third week.	Yes,
19. L. C. Lane,	Extended.	Thus displacement of condyloid frag- ment is prevented.	Never later than 48 hours.	Yes,
20. Basil Norris.	Flexed.	From fear of anchylosis. δ	Following day.	Eventually.
21. Jos. Ransohoff.	Flexed.	It ankylosis results most favorable position.	2 weeks or 10 days.	Yes.
22. Chas, A. Powers.	Flexed at an angle of 110° to 120° retaining normal angle between axes of arm and forearm.*	Results seem to justify such course,	Practically never.	Yes.*
23. J. D. Bryant.	Thus far al- ways in the flex- ed position.	Comfortable and convenient for the patient. Best posture if anchylosis occur.*	Do not consider passive motion essential to the prevention of an chylosis. Employ it occasionally.*	Yes.*
24, T. A. McGraw.	Fi exed at acute angle with lateral angular splints.*	Fear of anchylosis.*	End of week or 10 days.*	Yes, usually.*
25. C. W. Dulles.	Flexed invari- ably. Metal trough preserv- ing obliquity of axes of arm and forearm.*	Because I can secure thus the conditions requisite for good union with normal anatomical position and direction of whole arm.	Move elbow joint from begin- ning of treatment when changing splints.*	Yes.*
26. Parker Syms.	Flexed. Some- times have to vary this to re- place fragments,	For better position of tragments, and comfort and rest.	Fourth week.	Yes.
27. A. Vander Veer.	Flexed.	More comfortable for patient, and long time treatment among surgeons here.	End of third or fourth week.	Yes, in chil- dren. Not al- ways in adults.

What splint do you use for the ordinary fracture of the lower end of the radius?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of wrist and fingers?
Levis' or two straight.	No answer given.	Third week.	Yes.
Hollow, straight splints ending at the wrist.	For such dressing permits movement of wrist and hand.	At once.	After 45 years of age function of these parts will remain impaired.*
Silver fork.	Admits of free use of fingers.	Following day.	Yes.
Levis' palmar splint.	After reduction by hy- perextending as good as any other.	Ten days to two weeks.	Yes.
Two flat, heavy paste- board splints.*	Results seem to justify this procedure.*	Never.*	Yes.
Palmar and dorsal splints, padded to cor- rect deformity.*		Little attention is paid to passive mo- tion. It is not at- tempted until splints have been removed.*	Yes.*
Two straight, wide splints *	I have always obtained good results if I have been able first to reduce the deformity.	End of week.*	Yes; except in old people, those disposed to articular rheuma- tism and where there is great injury of joint and tendons.*
Always a straight pos- terior splint from elbow to first interphalangeal joint.	An accurate, cool and clean dressing.*	No occasion for passive motion, for have motion during all the time of treat- ment.*	Yes,*
Long palmer and dor- sal, fixing hand.	To secure complete fixation.	Fourth week.	Yes.
Lateral straight splints, Treat many cases with- out any splints.	Secure best results and greatest comfort.	End of third week.	Yes. Not always however.

Surgeon.	Do you treat fractures of lower end of humerus of ordi- nary severity in flexed or ex- tended position?	Why,	When do you begin pass.ve motion?	Do you usually expect to obtain good use of joint?
28. John B. Roberts.	Extended.	Carrying function is less liable to be impaired.	Not until union has occurred and dressings finally removed.	Yes.
29. Thomas Bryant. (London).	Flexed.	To relax muscles which move bone.	At end of second or third week.	Yes.
30. F. W. Murray.	Flexed.	Position more com- fortable to patient, and functional re- sults good.	Third to fourth week.	As a rule yes; but it depends or nature of frac- ture.
31. John E. Owens.	Flexed,	Fear of anchylosis.* 3	Four or five weeks in supra- condyloid frac- ture and 2 weeks in fracture of a condyle.	Yes.
32. N. Senn.	Extended.	In order to pre- vent rotation of fore- arm and preserve normal angularity be- tween forearm and arm.	After bony union has taken place.	Yes.
33. Reginald Harrison. (London.)	Flexed generally.	For accurate apposition and future usefulness.	Two weeks.	Yes.
34. Victor Horsley, (London.)	Flexed elbow	Comfortable, convenient, and affords the best means for relaxing the muscles.*	One month gently.	Yes.
35. J. Ewing Mears.	In flexed posi- tion.*	Better apposition of the fragments is secured by this method.	At the end of 12 to 14 days.	Yes.*
36. W. T. Briggs.	Extended,*	Muscles have least tendency to dis- place fragments.*	Not until bones are firmly unit- ed.	Yes.*
37. E. M. Moore.	Flexed for a week, then angle changed every other day by a new splint.*	Find it successful.*	Changing splint gives pas- sive motion enough.*	
38. L. A. Stimson.	Flexed.	For reasons given in paper last year.	If at all, fifth week.	Yes.

What splint do you use for the ordinary fracture of the lower end of the radius?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of wrist and fingers?
No splint or straight dorsal.	Simplest and best,	Not until union has occurred and dressings finally removed.	Yes.
Carr's is the best.	It supplies wants of case, and is comfortable.	At end of 10 days.	Yes.
Straight, wooden splints, anterior and posterior.	Simplest and best, and easiest of application.	In fingers 10 days. In wrist third or fourth week.	As a rule, yes. In old people there is stiffness at times. ε
Pistol shaped; com- press over back of wrist and an anterior board splint or Levis' splint.	Use first when the deformity indicates, the second for the same reason, the last when there is no deformity.	In about 2 weeks.	The greater the original deformity the greater is likely to be the impairment of function.
Have no faith in splints.	Because perfect repo- sition brings fragments accurately in apposition. They remain so without mechanical support.	After bony union has taken place.	Fair use of hand and fingers after several months.
Straight splint down to middle of hand.	Best apparatus.	Ten days.	Yes; if fingers are not cramped by the splint.
Carr's.	Most even support, Most opposition to re-es- tablishment of deformity. Least confinement of fin- gers.	Fingers 10 days. Wrist 1 month.	Yes.*
Bond's or Coover's.	Apposition more easily maintained and comfort given to the patient.*	Eight to ten days.	Yes.
Levis' splint or one that acts on the same principle.	Maintaining position as well as or better than any other apparatus.*		In the young, yes. In the old considerable stiffness at times.*
None. Cylindrical compress to hold up ulna while sling allows hand to hang down.*	Replaces ulna and draws extensor tendons over fragments.*	Not answered.	Not answered.
Moulded plaster of Paris.	Fits and stays best.	I have the fingers moved from the first.	

Surgeon.	Do you treat fractures of lower end of humerus of ordi- nary severity in flexed or ex- tended position?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of joint?
39. S. H. Weeks,	Flexed.	Maintains the fragments in best position.	Second week,	Yes.
40. Wm. J. Taylor.	Flexed.	Comfort to patient	End of third week,	Yes,
41. W. H. Carmalt.	Flexed with extension (trac- tion J. B. R.)	Most comfortable.	Two weeks.	Yes, depending upon age.
42. John B. Deaver.	Flexed.	Believe the results better.	Two weeks.	Yes.
43. J. R. Weist.	Flexed.	Best position of arm if loss of motion occurs,	Ten days.	Yes, often loss of perfect exten- sion.
44. M. H. Richard- son.	Flexed.	Better position of reduced fragments.	Three to four weeks.	Yes.
45. A. J. McCosh,	Flexed.	In case of anchylosis and no disadvantage.	Fourteenth to twenty-first day.	Yes.
46. Oscar H. Allis.	Extended.	Published reasons in Annals of Sur- GERY.	After union say 4 weeks.	Yes.
47. T. G. Morten.	Flexed.	Less danger of dis- placement of frag- ments.	According to age, 4 weeks.	Yes, if accurate reduction is secured.
48. T. S. K. Morton.	Flexed.	For fear anchylosis in extended position and because cases do well thus.	Almost immediately,	As a rule.
49. J. W. White.	Flexed,	More important muscles relaxed, bet- ter position of frag- ments, more comfort during treatment.	If joint is not involved in 3 weeks.	Yes.
50. C. B. Porter.	Flexed.	No answer given.	From third to tourth week	Yes.
51. H. H. Mudd.	Flexed.	More comfortable for patient going about and better if anchylosis occurs.*	After bone is firm at end of 4 weeks.	Yes.

What splint do you use for the ordinary fracture of the lower end of the radius?	Why?	When do you begin passive motion.	Do you usually expect to obtain good use of wrist and fingers?
Carr's.	Maintains the frag- ments in the best posi- tion.	Second week.	Yes.
Levis' tin splint always.	Retains fragments in position better than others; less deformity.	Beginning third week.	Yes, almost always.
Straight antero-posterior.	It usually meets indi- cations; if it does not, I use another.	Two weeks or less.	In children and youth, yes. After 50, no.
Bond and compress.	Believe the results bet- ter than by any other means.	Two weeks.	Very good,
Levis' metallic.	Seems to fill indications perfectly.	In one week,	Yes, except in old persons. ϵ
Posterior spoon and anterior flat.	Simple and effectual.	Three weeks.	Yes.
Short antero-posterior splints.	To prevent stiffness at wrist joint.	Twenty-eighth to thirty-fifth day, fingers moved from outset.	Yes.
Modified Bond.	After reduction of de- formity it affords rest.	Early after first week.	Yes, in cases of in- tense severity.
Immaterial; padded light splints. Bond or modification makes little difference what splint, if reduction is attended to.	The essential treatment consists in absolute and early reduction under ether.	Fingers early, wrist 3 weeks.	Yes, if reduction has been complete.
Bond or improvised of same nature,	Most comfortable, parts can best be kept in posi- tion by pads, joint most relaxed, good results.	Dress every or every other day and commence motion at first dressing.	Confidently in every case.
Two straight splints or Bond's splints preferably the former.	They meet all the indi- cations better than other dressings.	Fingers in a few days, wrist in 3 weeks very generally.	Yes.
Anterior and posterior.	No answer given.	Of fingers early and wrist a little in second week.*	In young and middle aged, yes. Old, not so good.
		44	

*					
Surgeon.	Do you treat fractures of lower end of humerus of ordi- nary severity in flexed or ex- tended position?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of joint?	
52. W. Meyer.	I treat fractures of lower end of humerus (condyles) of ordinary severity in semiflexed flexed and extended position Days Semiflexed, 10 Extended, 8	To avoid anchylosis. $\stackrel{\circ}{b}$	When changing splint and after 3 to 4 weeks.	Yes.	
53. J. H. Brinton.	Flexed by anterior angular splint,	Because with strong extension of forearm I can get good results.	As soon as the swelling or inflammatory symptoms subside, 8 to 10 days.	Yes.	
54. Louis A. Sayre.	Flexed usually.	Adjustment of bones equally good and position more comfortable to patient.	End of second week.	Yes.	
55. Wm. G. Porter.	Flexed.	Because I have always done so and am satisfied with the results obtained.	About tenth day.	Yes.	
56. Chas.K.Briddon.	Flexed.	Can get better ap- position with right angled anterior splint.	When the frag- ments are united.	Yes.	
57. Geo. McClellan.	Extended.	Because of the adjustment.	As soon as the swelling, etc, have been reduced.	Yes.	
58. Wm. Barton Hopkins.	Flexed right angle.	For better adapta- tion splint; hand doesn't swell.	Second dressing.	Yes,	
59. L. S. Pilcher.	Both.	Depends on com- fort of the patient and tendencies to displacement.	Never.	Yes.	
to. John Homans.	Flexed.	Because this posi- tion relaxes the mus- cles and retains the fragments in position, and, if anchylosis oc- curs, makes a more useful limb,	I use very little.	Yes.	

What splint do you use for the ordinary fracture of the lower end of the radius?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of wrist and fingers?
Hospital practice pasteboard and hand straight, private practice. Poroplastic felt (hand flexed.)	Hospital practice, convenient and sure. Private practice, result more insured.	In reviewing splint and after 3 weeks.	Yes.
Bond's in some form.	Get better results and less stiffness,	As soon as swelling, etc., begin to subside, 7 to 10 days.	Yes, unless the patient is very old or has rheumatic or gouty diathesis, etc.
Pistol shape, or according to Moore of Rochester.	Because it is followed by less deformity.	Early.	Yes,
Bond's or a simple straight splint.	I think the splint of lit- tle importance if the frac- ture has been thoroughly set and the deformity removed.	About tenth day.	Yes, in simple un- complicated cases.
After perfect reduction straight anterior spliat, padded to fit curvature of radius.	Because back splints produce mischevious pressure.	As soon as painless,	Yes, but only after persistent massage.
Levis' or flat angular splint with compresses.	The former when there is little deformity; the latter to relax the biceps when there is.	In third week.	Not always; depends upon amount of dam- age to surrounding parts.
Bond's splint, fingers enclosed in bandage.	Keeps its place readily, padded to fit.	Second dressing.	Yes, except in aged and rheumatic.
None.	None required.	After first week.	Yes.
At first external and internal splints, broad board, the posternor ex- tending to tips of fingers. Later a Bond's splint.	To support the hand and wrist and not to squeeze the radius and ulna together.	I use very little.	Yes, but not without deformity.

Surgeon.	Do you treat fractures of lower end of humerus of ordinary severity in flexed or extended position?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of joint?
61. Robert Abbe,	Flexed.	Because if the frac- ture is thoroughly re- duced under ether, it can be best main- tained thus.	I use very little passive motion. The patient's voluntary use is superior.	Yes.
62. W. T. Bull.	At right angle.	It permits easier apposition of fragments.	Three or 4 weeks	Yes.
63. R. N. Isham.	Flexed with inside splint.	To avoid inside deformity of elbow, with ease of position.	As early as fifth day,	Yes.
64. D. W. Cheever.	Flexed.	To relax muscles, etc.	Two to 3 weeks.	Sometimes.
65. J. A. Comingor.	Flexed.	In case of anchylosis, arm is more useful.	In 10 days,	Yes.
66. C. B. Nancrede.	Flexed.	At a right angle or less the (2) axes of arm and forearm co- incide and thus save carrying angle.	During third week, but don't believe in it.	Yes.
67. L. W. Steinbach.	Extended.	Because it is the natural position.	Three or 4 weeks	Yes.
68. H. R. Wharton.	Flexed.	Because it gives best result if joint function is impaired.	In about 3 weeks	Yes.
69. G. W. Gay.	Flexed.	Best way as far as I know.	In about 10 days.	Fair.
70. R. F. Weir.	Flexed.	Anatomically correct.	Early,	If not primari- ly involved.
71. A. T. Cabot.	Flexed.	To prevent posterior displacement.	After 3 or 4 weeks.	Yes.
72. F. Hartley.	Flexed.	Apposition better, dressing does not slip.	Three or 4 weeks	Depends on kind of fracture.
73. J. H. Packard.	Flexed.	Because it relaxes the muscles, and ob- viates deformity, etc.	At once.	That depends.

What splint do you use for the ordinary fracture of the lower end of the radius?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of wrist and fingers?
Nelaton's. Two flat and padded splints.	Pressure can be grad- uated and parts watched,	Four weeks.	Uniformly.
Short palmar and dorsal splints.	Simplest form of retentive apparatus.	Three or 4 days.	Yes, in majority of cases.
Short palmar and dorsal,	To permit flexion and adduction of hand.	Two weeks, but of fingers at once.	Yes.
Carr's or Bolles's,		Three to 4 weeks.	Doubtful.
Plaster cast.	Avoid stiff wrist and finger joints.	One week wrist, fingers one day.	Yes, have not failed for 15 years.
No special one, but always pad, etc., so as to conform to the normal curvature of radius.		Third week, but don't believe in it.	Yes.
Levis.	It conforms to the part in state of rest.	Three or 4 weeks.	Yes.
Bond's splint with com- presses.	Because I see the best results from this dressing.	Three weeks.	Yes.
Carr's or similar.	Light and convenient.	About 2 weeks.	Fair, except in old rheumatics.
Short plaster Paris after complete reduction under ether.		Early.	Yes.
Spoon and anterior.	I am accustomed to it.	Three or 4 weeks.	Yes.
Anterior and posterior long splints.	Absolute quiet better secured.	Three to 4 weeks.	Yes.
A small block of wood.	Because it prevents the flexion upward,	At once.	As a general rule, yes.

Surgeon.	Do you treat fractures of lower end of humerus of ordi- nary severity in flexed or ex- tended position?	Why?	When do you begin passive motion ?	Do you usually expect to obtain good use of joint?
74. Wm. Hunt.	Mostly flexed.	Better use insured.	Very modera- tely, 2 or 3 weeks	Yes.
75. J. M. Barton.	Both.	The position that keeps them best in place.	After 4 or 5 weeks.	Yes.
76. J. Ashhurst, Jr.	Flexed,	Gives better result.	Third or fourth week.	Yes.
77. S. Marks.	Flexed.	Has given better results.	Eighteen to 20 days.	Yes.
78. E. H. Gregory.	Flexed.	Satisfactory results.	Within 2 weeks.	Yes.
79. J. C. Warren.	Flexed.	To relax muscles.	Early second week.	Yes,
80. Roswell Park.	Extended.	To preserve carry- ing function.	Two weeks (?).	Yes.
81. L. M. Tiffany,	Not wedded to any position; po- sition varies with the fracture,	No answer given.	No answer given	In youth, yes
82. J. D. Rushmore.	Both.	To lessen deformity.	After bony union.	Yes.
83. P. S. Conner.	Flexed.	Habit,	Six or 7 weeks.	Yes.
84. T. F. Prewitt.	Flexed.	My results have always been satisfactory.	Seven or eight days.	Yes
85. E. H. Bradford,	In either position.	According to the situation of the fracture and extent of the displacement of fragments.	Four weeks.	Yes.
86. V. Czerny (Heidelberg).	Flexed.	The arm is more useful if anchylosis occur.	In the fourth week,	Yes.
87. D. W. Yandell.	Flexed.	I think I get better approximation of fragments.	Fifteen days.	I do.
88. W. W. Keen.	Flexed,	Secures union in good position; greatest comfort. If anchylosis, the most useful arm.	In third week.	Yes.

What splint do you use for the ordinary fracture of the lower end of the radius?	Why?	When do you begin passive motion?	Do you usually expect to obtain good use of wrist and fingers?
Vaire's, sometimes Bond's.	Reduce well at first and most splints will re- tain.	Very soon, say 10 days? Not severe.	Yes.
Bond, Levis or straight.	The one that keeps fragments best in place.	After 5 weeks.	Yes, and get it four times out of five.
Bond's and compresses.	Gives best result.	Second or third week	Yes.
Hamilton splint.	Gives good results.	Twelve to 15 days.	In the majority of cases.
Bent at wrist.	Easiest for hand.	Within 2 weeks,	Yes.
Bond's.	Leaves arm in natural position of relaxation.	Second week.	Yes, old people oc- casionally poor.
Have no favorite-pre- fer plaster Paris.	Because it can be accurately moulded.	Eight to 10 days.	Yes.
Straight.	Good results follow.	Motion never stop- ped.	Yes (always practically.)
Dorsal and palmer to knuckles.	Experience satisfactory.	After bony union.	Yes.
Either strip of adhesive or plaster of Paris.	Like it better,	Four to 7 weeks.	Yes.
Dosal and palmar, usually.	Readily obtained and results satisfactory.	In a week.	Yes.
Antero-posterior, fol- lowed by modified Bond or Carr's splint.	Fixation and preven- tion of recurring deform- ity.	Four weeks.	Yes.
Dupuytren splint, Bergmann's or Gypsum.*	According to circumstances of case.	After 12 to 14 days.	Yes; in old people and in cases of great comminution the result leaves much to be desired.
Two wooden splints wider than for earm, reaching from elbow to roots of fingers.	To keep fragments in apposition.	Two weeks; often not at all.	I do.
Levis or plaster.	Retains fragments best.	Two weeks.	Yes; sometimes not, because tendons caught in callus.

HYDROCELE IN THE FEMALE.1

[WITH A REPORT OF FOURTEEN CASES.]

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'HIS affection, on account of the small number of cases reported, as well as the brief and imperfect description it has received, at the hands of the surgical writers of the present period has come to be regarded either of doubtful existence or too rare an anomaly to deserve consideration. The daily examination of a large number of cases of hernia or of supposed hernia at the Hospital for Ruptured and Crippled has led me to believe that this affection is much more common than is generally supposed. While very little has been written upon this subject by American surgeons, the most extended article appeared in the American Journal of Obstetrics in 1881, from the pen of Dr. W. C. Wile (1). Although the two cases therein reported are exceedingly interesting, the attempt to prove them almost unique is not successful and I may be pardoned for calling attention to certain errors which are responsible for the mistaken impression caused by the paper. Dr. Wile stated "in all the ancient works at my command to consult I have not seen a single mention of it," and he further adds quoting from Dr. Bigelow, of Washington, who had consulted the library of the surgeon general, on the subject, "I have been through all the old Latin, French and German Literature from the Fourteenth Century to the present time and there is absolutely nothing.

¹Read before the Surgical Section of the New York Academy of Medicine, May 9, 1892.

Paré, page 233, edit. 1599, mentions it as a variety of tumor, but does not allude to it especially in the female. Scarpa, 1584, speaks of it merely in connection with scrotal hernia. I went through everything and can only find the following," and he goes on to cite a German and an Italian periodical of 1879 and 1880. Without questioning in any way the sincerity of these statements a failure to point out the errors which more careful research has brought to light would be a failure to ascribe to the surgeons of the past the credit that justly belongs to them.

This affection was not only recognized in very early times, but actual cases were carefully reported, and in not a few cases the diagnosis was confirmed by operation.

Three cases were reported previous to 18co, viz.: by (2) Ætius, 543 A. D., Plater (4) 1536 A. D., Bertrondi (3) (1723). Scarpa (6) 1747–1832 gave a good description of it in the eighteenth century in his memoir upon the Tumors of the Spermatic Cord, and referred to it as "Hydrocele of the Canal of Nuck." (7) Desault, 1737–1762 in the Journal d'Chirurg., Tom. I, 251, describes a case in detail, in which the diagnosis was made certain by operation and the sac excised.

Lallement (8), Surgeon-in-Chief to the Hospital of Salpetrière, reported a case in 1795.

Coming down to 1832 we find an exhaustive monograph by an Italian surgeon, George Regnoli (9), Professor of Surgery at the University of Pisa. This paper received so much attention that a review and abstract of it, 27 pages in length, appeared in the Archives Generales, Tom. V. Ser. II. 114. Regnoli not only described a very interesting case, treated at his own clinic with two others observed by Palletta, but he gives by far the most complete as well as the most accurate description of the anatomy and pathology of this affection that has ever been written. With all that has since been learned scarcely a single addition or correction could be made to the clear and admirable picture drawn by him in 1832. Few cases were reported by English surgeons previous to 1850, but during the decade 1850–1860, of ten cases reported, five were by English observers.

The first American case that I have seen reported is Bennett's, (10) of Danbury, Conn., published in the *New York Med. Record*, Nov. 15, 1870.

That the affection had been seldom recognized by American surgeons and gynæcologists is clearly shown by Dr. Wile's paper, which contains in brief the answers to 50 letters of inquiry sent to the most prominent surgeons and physicians in the country. Not more than three or four of the whole number had ever seen a case.

In 1884 Prof. Hennig, (11) of Leipsig, made a thorough investigation of the subject. He reported two cases observed by himself and found 37 others in literature.

In 1890 Wechselmann, (12) of Berlin, published a very exhaustive paper, and to his careful and laborious research we are largely indebted for our more recent knowledge. He had observed two cases in a single year in Madelungs Klinik, and his entire collection contains 62 cases.

In thus briefly summarizing the literature on the subject I have endeavored to show that this affection was not only recognized by surgeons three centuries ago as theoretically possible, but that practical illustrations were recorded, and further that more recent and a constantly increasing number of cases has proved the correctness of the early observers.

Since September, 1890, I have seen at the Hospital for Ruptured and Crippled, 14 cases of hydrocele in the female, which added to one previously observed at the New York Hospital, makes 15.

The diagnosis was not only confirmed by two or more surgeons, but rendered certain by aspiration or operation.

Before analyzing these cases or describing them in detail I shall say a few words in regard to the anatomy and pathology of the disease.

"Hydrocele muliebris," "cyst of the round ligament," "hydrocele of the canal of Nuck," are terms applied, indiscriminately, to this affection, by most writers. The broad classification of Regnoli, which includes all cysts in the inguinal region (in the female), connected more or less intimately with the round ligaments, under the general term "hydrocele muliebris," seems to me the most rational and the best. This classification has never been accepted by the French writers, and hydrocele muliebris has been understood by them only in its most limited sense, viz.: a serous collection in a true processus

vaginalis peritonæi, or diverticulum of Nuck. The existence of such a diverticulum they strenuously denied, and, consequently, could not admit the possibility of a hydrocele of such a diverticulum.

The arguments against the existence of a diverticulum of Nuck brought out in the Theses of Duplay (13) and Robère (14) were based chiefly upon the examination of twenty-one female embryos during the fourth and fifth month of life.

The later and more thorough investigations of the German pathologists have placed the existence of a true diverticulum of Nuck beyond all question, and a recently reported case by Richelot (15), together with one operated upon by myself, have made the existence of a hydrocele of such a diverticulum an equal certainty.

Niemann (16) found this process of peritonæum present 28 times in 46 cases.

Bergmann (17)examined 158 inguinal canals in the female from birth up to the age of three years. In these cases he found the canal of Nuck open as far as the external ring, once on the right side, three times on the left, and once on both sides. In addition he found 12 cases in which there was only partial obliteration; 9 on the right, 2 on the left and one on both sides.

Sachs, (18) in 150 cases examined during the first year of life found the diverticulum of Nuck pervious entirely or partially 37 times.

Zuckerkandl (19) in one hundred children found the canal. open 20 times, 3 on both sides, 12 on the right and 5 on the left.

Féré (20) in 100 observations found the canal open 13 times. Engel (21) in 100 observations found the canal open 31 times.

To turn now to the clinical and more practical aspect of the subject. Of the 62 cases in Wechselmann's collection there were only two that could be properly termed Hydrocele of the Canal of Nuck in the narrow sense as used by the French and even these two were not absolutely demonstrable.

To prove the point beyond question one case would be sufficient, but such a case must not only be a cystic tumor in the inguinal region, but its interior must be shown to have a communication with the abdominal cavity.

This cannot be proven by showing the tumor to be cystic by aspiration and reducible by pressure, a small portion of omentum might easily be present with the fluid and not recognized. The additional evidence necessary can only be gained by an operation, the finding of a sac lined with peritonæum, having an unobliterated connection with the abdominal cavity, and yet of such conformation as to exclude the possibility or probability of a true hernial sac. Only two cases that I have found fulfill these rigid requirements.

The first was published by Richelot, in 1890, in L' Union Medical, and the other was operated upon by myself in December, 1891, at the Post-Graduate Hospital.

Richelot's case was a girl 19 years of age. A small swelling had existed in the inguinal region for four years. No exciting cause was known; the swelling could be forced back by gentle pressure and disappeared on lying down. There was no impulse on coughing, and she had never had any symptoms of hernia. The diagnosis was made by the history and character of the swelling and was confirmed by aspiration. A radical operation was advised on the ground that it caused considerable mental anxiety, was a barrier to marriage, which the patient was entertaining and further, that its presence greatly predisposed to a hernia.

An incision was made as for a hernia, a small sac was found filling the inguinal canal and extending some distance beyond the external ring. The sac contained clear serum and communicated with the abdomen by means of a minute opening. The sac was ligated high up, the lower portion dissected out and the wound closed. The patient was up and about in ten days. This case was widely reported in France and Tilleaux (22), the well-known anatomist referred to it at length at a meeting of the Academy in September, 1890.

My own case is almost exactly similar to Richelot's, except that it occurred in an older woman and had a supposed exciting cause. Although it did not disappear on lying down or under moderate pressure it did communicate with the abdomen by an even smaller opening. The following is a brief history of the case:

The patient was a widow, 47 years of age. She had never had children; menses were irregular, but she had not reached the menopause.

About four years ago, while alighting from an elevated train, her left leg was severely wrenched. Acute pain and tenderness in the right inguinal region immediately ensued, accompanied by diarrhoea and profuse menorrhagia. A few days afterward a small, slightly tender swelling appeared in the above-mentioned region. The swelling never disappeared, and two years later she was examined by a physician of this city who pronounced the trouble hernia, and advised a truss. The truss was not worn, and the swelling remained about the same with slight increase in size. There were no symptoms other than a feeling of discomfort.

In October, 1891, she again sought advice at one of the hospitals, and for three weeks she was treated for an irreducible omental hernia, by means of a spica bandage and pad. I first saw her Nov. 9, 1891. A careful examination showed a tumor the size of an English walnut in the left inguinal region. The tumor was irreducible, and had the peculiar elastic feel suggestive of a cyst. I thought it probably was a hydrocele of the canal of Nuck, and aspiration with a small hypodermic needle, showing clear straw-colored serum confirmed the diagnosis. The fluid exactly resembled the ordinary hydrocele fluid in the male, and contained about the same percentage of albumen.

About two weeks later the swelling was again aspirated and about one drachm of similar fluid removed. The patient being of a very nervous temperament, and the presence of the cyst increasing the liability to hernia, an operation was advised and consented to.

On December 15, 1891. I made a 2½ inch incision, as for an inguinal hernia; a thin walled cyst the size of an almond, was found emerging from the external ring. The walls were partially collapsed, owing to the recent aspirations and probably also to the frequent manipulation forcing some of the fluid back into the abdomen. On opening the cyst clear fluid escaped, showing a cavity lined with peritonæum and communicating with the abdominal cavity by means of a very small opening just admitting a probe.

The sac was easily freed, drawn down, ligated high up, and removed.

The wound was closed without drainage. The patient left the hospital at the end of ten days.

Case II.—In March, 1892, I operated upon a second case. Without going into detail the main facts were as follows: A woman 29 years of age, married (1 year), without children and never having been pregnant, had noticed a small swelling in the left groin one month before. It caused much anxiety and she stated that there was a constant dull pain in the region of the swelling. Examination showed a swelling the size of an almond in the left inguinal canal, but easily reducible within the abdominal cavity. It had the characteristic elastic feel, and on aspiration I withdrew clear fluid. Two weeks later I operated, but unfortunately under ether the tumor remained, reduced within the abdominal cavity and I was unable to find the sac.

Case III.—On May 6, I operated upon a third case, and the sac which I removed from this case is the specimen which I present to you this evening.

The history of the case is interesting inasmuch as it is a perfectly typical case, and moreover illustrates two methods of treatment.

The patient was a woman 29 years of age, married, with one child 11 years old. Six years ago without any cause other than a possible strain, she discovered a small swelling in the right inguinal region. It was never reducible, increased slowly in size until one year ago, when it had reached the size of a small hen's egg. At that time she consulted a physician, and being told she had a hernia she applied to the Hospital for Ruptured and Crippled for treatment. The diagnosis of hydrocele of the canal of Nuck was made by Dr. Milliken and the tumor was aspirated and several drachms of clear fluid withdrawn. It returned quickly and a second aspiration with carbolic acid injection was made a month later. The swelling remained very small until three months ago, when it began to increase rapidly in size and caused dull pain and much discomfort. The swelling in April, 1892, was the size of a small hen's egg, irreducible and of firm elastic feel. It was distinctly located in the inguinal canal. Aspiration showed the contents to be clear fluid and operation was advised.

On May 6, 1892, I made an incision 2½ inches long just above and parallel to Poupart's ligament. A serous sac the size of a small hen's egg was found just outside of the inguinal canal. On opening this several drachms of clear fluid escaped. The interior of the sac contained several thin walled partitions and the neck of the sac extended up into the abdomen, but was not pervious beyond the internal ring. The sac was so intimately adherent to the round ligament that a portion of the latter was removed with it. The sac was ligated at the internal ring and removed. The wound was closed with deep

buried sutures without drainage and the wound healed primarily without any reaction and the patient was up and about in 7 days.

The other cases having been treated by aspiration without operation have been simply tabulated and the important features noted.

Now that hydrocele of a true diverticulum of Nuck has been proved to actually occur, it is probable that many of the cases reported were of this variety. Although there was no operation to confirm the opinion, as evidence in favor of this view may be cited the fact that some of the cases give a history of having been at one time reducible.

The classification adopted by Regnoli, to which I have already referred, is in brief as follows. He divides all cases of hydrocele muliebris into five varieties.

First variety. A diffuse hydrocele or hydrocele occurring in the cellular tissue enveloping the round ligament, the cellular tissue having been transformed into a serous membrane, as frequently happens in a hydrocele of the spermatic cord.

Second variety. An accumulation of fluid in an actual prolongation of peritoneum into the inguinal canal, or a hydrocele of the canal of Nuck, proper, (the communication with the abdomen remaining). This variety Regnoli considered rare, no case having been observed up to his time to his knowledge.

Third variety. Different from the second variety, only in the fact that the pouch of peritoneum no longer communicates with the general abdominal cavity.

Fourth variety. An encysted hydrocele in the connective tissue about the round ligament (similar to the first).

Fifth variety. An accumulation of fluid in the remains of an old hernial sac.

The fifth variety is rare and can usually be readily diagnosed by the previous history of a hernia. Hydrocele of the hernial sac without the presence of a portion of irreducible omentum, and the history of long standing hernia is a rare complication. In the collections of McArdle and Kolipinski (23) (XXIX cases) these conditions almost universally obtained. Two of their cases are extremely doubtful, viz., cases of Curling and Duclas, the fluid in the hernial sac being far more probably an acute exudation due to

a strangulation of the bowel, a result that is very common. Two other cases were undoubtedly mistaken for hydrocele of the round ligament, (cases of Nerard and Tanfin.)

The remaining four varieties may for practical diagnosis be synthetically grouped into two main classes, viz., one including all those cases where the cyst is found in a true peritoneal prolongation or diverticulum of Nuck: the other, all cases where the cyst has developed in the cellular tissue about the round ligament.

This second variety is probably the more common judging from analogous cases of hydrocele of the spermatic cord.

In twelve cases of hernia in children upon which I have recently operated, this condition, viz., a hydrocele in the cellular tissue about the cord was found, quite independent of the true hernial sac, in three cases. This condition is very frequently diagnosed as adherent omentum.

Aetiology.—Very little is known as to the cause of the affection, as might be expected from its analogy to hydrocele in the male. Age seems to have little influence. The youngest case observed being three months old and the oldest sixty years. In the largest number of cases it occurred in middle life between the ages of thirty and fifty years.

Traumatism has been occasionally antecedent and doubtless has a causative influence.

Disturbances of menstruation and pregnancy have been regarded by some as playing an important role in producing the affection, but in the cases that I have observed I have not been able to verify this opinion. In one unpublished case, I have learned that the pain and discomfort were greatly aggravated at the time of menstruation.

The affection, like inguinal hernia, is found more frequently on the right side. In 63 cases in which the side was mentioned it was found on the left side in 25, on the right in 36 and on both sides in two cases.

Size.—The size varies within wide limits, from a hazel nut to a child's head. The contents of the cyst are usually clear straw-colored serum with a specific gravity, 1012–1016, containing a small amount of albumen and considerable sodium chloride.

DIAGNOSIS AND TREATMENT.

That the diagnosis is more or less difficult is shown by the fact that the affection is so seldom recognized, being usually mistaken for and treated as a hernia, I believe that a differential diagnosis is possible in nearly every case if the following conditions are borne in mind.

Given a tumor of peculiar elastic feel distinctly located in the *inguinal canal* or extending up into the inguinal canal, not reducible (or rarely so), without impulse on coughing, with a history of having originated without apparent cause, of having existed for a considerable length of time, with a gradual increase in size accompanied by no constitutional and few local symptoms, other than a feeling of discomfort or slight pain, I should strongly suspect a hydrocele of the round ligament.

The diagnosis could then be easily confirmed by aspiration or by making use of the light test if the tumor were of sufficient size.

The point which I mentioned in regard to the tumor being distinctly located in the *inguinal canal* cannot be too strongly insisted upon.

I feel convinced from a careful reading of the cases reported that some were incorrectly diagnosed, and instead of being hydrocele of the canal of Nuck were really either hydrocele of the sac of a femoral hernia or cysts of the vulvo-vaginal glands. In several cases the observer has described the tumor as exactly in the region for femoral hernia, and the diagnosis rested entirely upon the character of the swelling and the contents as shown by aspiration.

The following case recently observed by myself and afterwards operated upon by Dr. W. T. Bull, at the New York Hospital; is directly in point and shows the possibility of such an error.

The patient was a woman 22 years of age, unmarried and in good general health.

Without any history of strain or apparent cause, a swelling had appeared in the right groin, three weeks before. There had been little actual pain, but considerable discomfort, especially during the last week. On examination I found a small swelling the size of an

almond, very firm and elastic, freely movable and situated in the right groin. It was at first thought to be above Poupart's ligament and a true hydrocele of the canal of Nuck, but later and more careful examination showed it to be just below, and the external ring was free. I aspirated and drew a small syringe full of serum, tinged with blood. She was seen again one week later, and as no change had taken place in the character or size of the swelling, an operation was advised and per-The swelling had formed on February 15, 1892, by Dr. Bull. diminished somewhat in size as a result of frequent examinations, but was shown to be below Poupart's ligament before the operation. An incision was made as for femoral hernia, and sac lined with peritoneum and partially distended with clear serum, was found emerging from the femoral opening and extending about an inch beyond. incising the sac the fluid escaped, showing a perfectly empty cavity. A director was easily passed into the abdominal cavity and later a large probe 1/4 inch in diameter, showing that the adhesions at the neck which had temporarily shut it off from the abdominal cavity must have been recent.

The sac was drawn down, ligated and excised and the operation completed as for an ordinary femoral hernia.

Here is a case that without operation or the utmost care in locating the swelling would have been recorded as a case of hydrocele of the canal of Nuck.

In one of the cases reported by King the swelling was described as in the "femoral region," and as no operation was performed other than aspiration, it must be regarded as a doubtful case. Dr. Bull has operated upon one other case similar to the one I have just described, and I have found a third case in literature, reported by Heddaus (25) in 1869, under the heading "Herniotomy Without a Hernia." The patient, a woman 38 years of age, had a swelling in the right femoral region the size of a walnut. As she had severe constitutional symptoms an operation was performed disclosing a cyst filled with fluid, but no rupture was found. She continued to grow worse and died 5 days later, with symptoms of general peritonitis. No autopsy was made.

The danger of confounding this affection with a cyst of the vulvovaginal glands must likewise be borne in mind.

In the second case reported by Dr. Wile the diagnosis is not above suspicion. A small swelling had appeared in the "right labium" 17 years before, had remained almost stationary until a few

months previous to his observation, at which time it, curiously associated with renewed marital relations and increased sexual activity, began to rapidly increase in size.

The tumor was described by Dr. Wile, as situated in the right labium the size of a turkey egg and "completely occluding the vagina." This description, together with the history of the case, makes a cyst of the vulvo-vaginal glands the more probable diagnosis.

In October, 1891, I operated upon a case at the Post-Graduate Hospital very similar to the preceding. The patient, a woman 47 vears of age, had had a swelling in the right labium for several years. It had been repeatedly "lanced." At the time of my observation there was a swelling the size of an orange in the right labium extending up to the external ring. It was elastic and fluctuating, but not translucent. It had existed two years and had slowly increased in size, and gave rise to no symptoms. Both hernia and hydrocele of the canal of Nuck were excluded from the history and the location of the tumor and a diagnosis of cyst of Bartholini's gland was made, which was confirmed by the operation. The contents proved to be a chocolate colored fluid of syrupy consistence. The cyst wall very closely resembled a thickened hernial sac. It was a perfectly closed sac and extended from the lower portion of the labium major very nearly to the external ring. I dissected the sac entirely out and removed all the redundant, pendulous skin.

Primary union followed and the patient was about in a week.

An additional point that materially aids in the diagnosis is the position of the tumor when first noticed. The hydrocele of the canal of Nuck always appears first in the inguinal canal, and may gradually enter the labium, while the cyst of the vulvovaginal glands always begins in the labium and may later rise as far as the external ring. To the 62 cases in Wechselmann's collection I have added 30 others, including the 14 cases observed at the Hospital for Ruptured and Crippled, to which I have already referred, and which form the basis of this paper.

An analysis of these 92 cases not only gives us the requisite data to form a clinical picture sufficiently clear to enable us to make a diagnosis in most cases, but it also makes it possible for us to arrive at certain conclusions as to the best method of treating this disease. Of the 62 cases previously reported 22 were treated by operation, the sac being excised in most cases.

The remainder were treated by aspiration with the injection of iodine (or of some similar substance) or by simple operation.

There were two deaths, only one, however, was the result of the operation, the other being due to a co-existing acute tuberculosis of the lungs. Of the thirty cases that I have collected 12 were treated by operation and 18 by aspiration or aspiration with injection of iodine or carbolic acid. There were no deaths following the operation, and no recurrences, as the sac was in nearly every case excised. Of the 18 cases treated by aspiration and injection nine recurred and several of the others probably recurred, it not having been possible to trace them.

There are six cases, three in Wechselmann's and three in my collection, in which the hydrocele of the canal of Nuck was associated with a separate hernial sac. The diagnosis was not made in any of the cases until the operation. I have purposely dwelt at considerable length upon the difficulties of diagnosis for the reason that they have an important bearing upon the question of the proper method of treatment. They show that the common method of aspiration and injection of some irritating fluid is not only open to the charge of being unscientific, but that in some cases it might be a source of actual danger, and they furnish additional evidence in favor of the radical operation, with excision of the sac. If the sac communicates with the abdominal cavity, a point that can only be settled by an operation, (as shown by two of the cases I have reported), it is manifestly unwise to inject an irritating fluid into such a sac.

On the other hand, even if the sac does not communicate with the abdomen, the operation will not have been done in vain for it furnishes an opportunity to close the canal and thus render the patient less liable to a hernia, to which the dilated and weakened canal predisposes, and furthermore, while equally safe, it offers a far better chance of a permanent cure of the hydrocele than any method of injection.

The accompanying table contains a summary of the thirty cases that I have collected, including my own observations at the Hospital for Ruptured and Crippled, in the clinic of Dr. William T. Bull.

¹Berger, two cases; Bull, one case.

RESULT REMARKS		ure — granula- tion 5 weeks		Associated with true hernial	Associated with a true hernial	Associated with a true hernial	cure			
R	ure	tion	are	Cure	Cure	Cure	Final cure	Cure	Cure	Cure
TREATMENT	Operation—4 inch incision, Cure 16 dr. clear fluid; excision sac.	Operation—sac filed with Cure — granula- turbid fluid tion 5 weeks	Op. July, '91-sac6 ctm. long Cure connected with abd. cov., small opening	pain-Operation-excision	None of impor- Operation-excision, sac ad- Cure tance herent to round ligament	Excision	Six operations	Occasional slight Aspiration—twice pain—irreduc.		Operation-excision sac
SVMPTOMS	None Irreducible	Walnut — Sup Pain — come on Operation—sac posed Fem, after lifting turbid fluid Hernia.	None	Slight pain- truss painful	None of impor- tance		None Irreducible	Occasional slight pain-irreduc.	Appeared soon a aspirations after child birth -reduced first,	
Sizir	Fist Pear shape	Walnut — Sup posed Fem. Hernia.	Goose egg	Walnut	Pigeon's egg		End thumb	Walnut	Pigeon's egg	Almond
SibE	7	×	×				24	L	~	
DURATION	Yes 11 Years	2 Days	6 Years	3 Vears	6 Months	1 Vear	6 Years	Several Yrs. L	2 Vears	
Снігряви	Yes	9-	м	0	0	φ.,	0	+	es	0
МАКИЕВ ОК	S	Q+	M	# =	S	Q -1	g _a	M	M	M
aoA	33	0.	36	31	20	45	4	ad.	00	23
(ISSERVER AND REFERENCE	Lammert La Riforma Medica,1891, 181	Franke Archiv. f. Patholog Anat., 1890, CXII, 458	Smital Wien Klin, Woch.,1889, 2, 800, 823, 845	Bull et. Mem. de la Soc de Chir., 1891, 1833	Berger Ibid	Annales de la Soc Med- Chir. de Liége, Dec., 1891	Wright, J. W. N. Y. Med. Jour., 1887, 45, 357	Wright Ibid	Wright Ibid	Abbe Robert Personal Communication

RESULT REMARKS		1	ure	nre ·	ence—sac ? ccised Probably omen- tal hernia	g days	ure up and about 7 days	
RE	Cure	Cure	Final c	Final c	Recurre not es	Cure in	Cure	Cure
TREATMENT	Excision sac	Complication — Operation—sac had small Cure with properity communication with hertoneal hernia nial sac, excision	Exact situation Tapped—clear serum recur- for Fem. Her- nia months later, iodine injec- tion	Tapped—15 pint canary col- Final cure ored fluid, several tappings finally tod ne injected	Operation for supposed Recurrence—sac strangulated hernia not excised	Smallegg (hen's) Irreduc. — pain Operation Dec., 1891—exci. Cure in 9 days increased at sion sac menst, period	Small hen's egg Irreduc.— slight Recurred from aspiration Cure up and and injection, 6 years ago. about 7 days Operation May, '92, excision sac	Mmond-reduc. Pain slight—con. Aspiration at first operation 1 Cure siderable dis- month later, sec not found, comfort and tumor reduced index ether canal closed
Symptoms		Complication — with properi- toneal hernia	Exact situation for Fem. Her-	None	None	Irreduc pain increased at menst, period	Irreduc.— slight pain	Pain slight—con- siderable dis- comfort
Size	Walnut	Fist	Small-irreduc.	Pear-irreduc.	Egg-irreduc.	Small egg (hen's)	Small hen's egg	Vimond-reduc.
Side		~	×	×	≃.	J	24	_
DURATION		7 Years	7 Weeks	7 Years	Yes 15 Years	4 Years	6 Years	2 Mon.hs
Снігряви		н			Yes	0	-	0
Млякиер ов	S	M	M	S	M	M	M	M
яэУ	25	4	99	35	\$	47	99	27
OBSERVER AND REFERENCE	Abbe Robert Personal Communication	Bull, W. T. N. Y. Hosp. Clinical Re- port of Op. Surg., W. B. Coley, N. Y. Med J., 1891	King Canada Lancet, 1886	Osborn London Lancet, 1885, 1, 423	Hare, Charles A. Monograph case of hydrocele and canal of Nuck, D. Appleton & Co., 1872	Hospital for Ruptured and Crippled. Person- al observation	Tbid Coley	Ibid
	4.0	2	13	7	Z EN	16 H	17 Tbid Cole	81 11 11

	OBSERVER AND REFERENCE	Yer	Макківр ок Бімськ	Снігряви	DURATION	Side	Size	Symptoms	TREATMENT	RESULT	REMARKS
print	Ruptured	00	vo.		0.	~	Almond	None	Aspiration-iodine externally Recurred	Recurred	Property of the second
(person)	and Crippled	35	M	M	1 Year	×	Almond	None	Aspiration		
(maj	Ibid	14			2 Months		Almend-reduci- None ble to internal ring	None	Aspiration - operation ad-Recurred vised, not consent	Recurred	
pent	Ibid	3 11.				×	Hazeinut	None	Iodine externally	Hernia followed	
100	Ibid	31	SO	* -	3 Years	×	Walnut Irreduc.	None	z aspiration and injection iodine	Recurred	
-	Ibid	+	S		1 Month	×	Pigeon's Egg Irreduc.	None	Aspiration	Recurred	
hand	Ibid	3 m.				×	Small	None	Aspiration	Recurred	
bend	Ibid	12			4 Weeks	T	Almond Irreduc.	None	Aspiration	0	
Beend	Ibid	20	M		ı Vear	T	Egg Irreduc.	None	Aspiration	ø	
-	Ibid	00				×	Almond Irreduc.	None	Aspiration	0	
land.	Ibid	80	SO		4 Vears	L	Walnut	None	Aspiration	Recurred	
00 200	Senn Ref. Hand Book Med. Science, see Hydrocele	4	M		3 Vears		Anter. % of la-None bium	None	Operation-excision sac	Cure	

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FRACTURES OF THE NECK OF THE FEMUR,1

WITH A REPORT OF TWELVE CASES TREATED BY THE THOMAS HIP-SPLINT.

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THE object of this paper is to call attention to a means for the treatment of fractures of the neck of the femur which I believe has not heretofore been employed in this country, namely, treatment by means of the Thomas hipsplint.

Dr. Ridlon's Case. On January 2, 1891, Mrs. H., aged 74 years, while descending a flight of dark stairs, turned before reaching the lower stair, stepped unexpectedly on its edge, and being a stout woman, fell heavily, striking on the right side. The ankle and knee were sprained and the neck of the femur fractured. She was seen at once by Dr. H. M. Hooper, of Rutherford, N. J., then practicing at Staten Island. Drs. Walser and Martindale were called in consultation and examined the patient twice, once without and once under an anæsthetic. The diagnosis of fracture of the neck of the femur was made certain, the usual result prognosticated, and the limb was put up in the long side splint, weight and pulley and sand bags. The patient suffered so much from pain during the days and from starting pains during the nights that she was losing strength and courage, and it was found so difficult to move her for change of bedding and the adjustment of the bed-pan that I was called to devise some means of relief. On January 14, twelve days after the accident, I applied the Thomas hip-splint with retentive traction. At that time there was one-half inch of shortening, but no other noticeable deformity.

¹Read before the Surgical Section of the New York Academy of Medicine, May 9, 1892.

The movements at the joint were not tested-indeed, the limb was not moved from its position in the bed during the application of the splint, which was effected without causing the slightest pain. All pain, excepting some starting at night, ceased within forty-eight hours, and the night pain ceased at the end of ten days. The patient remained perfectly comfortable and free from pain from that time on. The bed-pan could be used without difficulty and without causing the patient any suffering. At the end of eight weeks, on March 11, the splint was removed in the presence of Dr. J. R. Williford, of Memphis, Tenn., and the joint motion tested for the first time. Union was found to be perfect and sound; motion was free and painless in all directions, and no tenderness was found on palpation. The knee was The patient remained in bed without treatment four or five weeks longer, getting up for the first time on April 9. She walked with crutches, or crutch and cane until August 15, when she was able to put both away and walk without difficulty, except such as arose from a somewhat stiff knee. After the removal of the splint, the patient was next examined by me on April 24, 1892. She can go up and down stairs unaided, and walks without crutch or cane and with scarcely a noticeable limp. There is normal motion, perfectly free and painless, at the hip-joint in all directions; the knee can be flexed only 48 deg.; and the ankle is somewhat stiff and thicker than normal.

Dr. J. R. Williford's Case. - Martha Bumpas, aged 70 years, patient of Dr. Walter Stewart, of Memphis, Tenn., made a misstep and fell to the ground on November 30, 1891. A temporary dressing, consisting of a bandage around the limb over two splints, was applied. On December 1, Dr. J. R. Williford, to whom I am indebted for permission to publish this case, was called in consultation; and two days later, December 3, he applied a Thomas hip-splint, which a blacksmith had constructed under his supervision, at an expense of \$2.50. The diagnosis of fracture of the neck of the femur was based upon the pain about the hip, which was increased by any motion. eversion (outward rotation) of the limb, helplessness, the patient being utterly unable to move the limb, and slight crepitus with great pain on attempts to rotate the limb inward to its normal position. All pain ceased within a few hours after the Thomas splint had been applied. About three weeks after the commencement of treatment the patient was moved to another house, a distance of three miles, without pain or any suffering. The splint was removed on January 26, 1892, having been kept on seven weeks and two days. There was found to be three-eighths inch shortening, free motion in all directions without pain, and the patient was able to lift the limb in bed and move it freely about. The knee was somewhat stiff. She remained in bed five weeks longer, until March 3; and now, April 21, 1892, is walking without crutch or cane.

Mr. Robert Jones' Cases.—I am able through the kindness of Mr. Robert Jones, of Liverpool, England, to report upon ten of the forty cases treated by the late Hugh Owen Thomas and himself, these being all of the unpublished cases that Mr. Jones was able to hunt up in the time at his disposal.

Case 1. A. M., aged 65 years, tripped over a stone and fell sustaining a fracture through the neck of the femur. Shortening an inch and a half, eversion, and excruciating pain. Traction was applied by elevating the foot of the bed and fastening the foot to the bed frame; Thomas's hip splint applied; traction done away with at the end of a fortnight. The long splint was transformed into a walking splint and the patient allowed to go about on crutches; after four months the splint was removed. The patient fully recovered, and now two years afterwards is able to walk long distances without fatigue. There is half an inch shortening.

Case 2. Mrs. F., sent by Dr. Adam, a tall, gaunt woman aged 74 years, fell down stairs and fractured the neck of the femur. There was an inch shortening; the old lady was very anxious that the limbs should be of the same length; applied the Thomas splint with retentive traction. The patient was in bed for three months, being too timid to get up. She had an attack of eczema lasting through the whole period, dating from before the injury. There was no pain or inconvenience after the first week, and she was easily lifted in the splint by an attendant. Six months afterwards she was walking, with less than a quarter of an inch shortening, complained of no pain in the hip, and was able to sit down and get up again without assistance.

Case 3. Bridget McCarthy, aged 69 years, short and stout; fracture of the neck of the femur, complicated with chronic bronchitis. The region over the hip was acutely painful on pressure, the bed-clothes even giving her pain; three-quarters of an inch shortening. The hip being too painful to bear the pressure of the posterior bar of the splint, she was fitted with a double hip splint with that part of the stem at the back of the tender joint omitted. By this means she was kept under control, and by placing pillows above and below there was complete absence of pressure over the articulation. The patient made an admirable recovery. The head of the bed was ele-

vated three feet because of the chest symptoms with the splint tied to the top of the bed to prevent slipping. The patient was walking with two sticks at the end of three months. There was three-quarters of an inch shortening.

- Case 4. A. F., aged 67 years, fractured the neck of the left femur by direct force; fracture impacted; inversion; three-quarters of an inch shortening. Treated with the Thomas hip-splint in bed for six weeks. After two and a half months was walking with one stick. Fifteen months after injury was doing his work as a stableman in a team-owner's yard. Inversion was not noticeable in walking, although no effort was made at the time of the accident to disentangle the fragments.
- Case 5. Mrs. Shirley, sent by Dr. McDougal, aged 60 years, tall and thin, fractured neck of right femur in getting out of bed, then fell heavily sustaining severe scalp wound. Had very little pain at the hip; there was eversion, crepitus, and one inch shortening. Hipsplint applied with retentive traction. No inconvenience from the splint; in bed seven weeks; insisted on getting up; splint shortened; gradually regained power, and ten months afterwards was able to walk a mile with one stick.
- Case 6. A farmer, sent by Dr. Harcourt, aged 70 years, short and fat, fell from a haystack and fractured the neck of the right femur; suffered acute pain; great trochanter very prominent. The hip-splint was applied with the posterior bar made quite straight and of extra strength. Was very comfortable in the appliance after the first week. Shortening at the time of the accident one inch, which was reduced to half an inch. Was unable to move from bed for ten weeks: continued to wear the splint out of bed for three weeks. Shortening, eight months after the accident, half an inch. Complains of pain in the hip now and again, but is able to do some work on his farm.
- Case 7. R. M., aged 72 years, sent by Dr. Shearer, fell getting out of a brougham; fractured the neck of the right femur; half an inch shortening; great pain down her leg, especially along the ham strings; a tall and thin woman with sensitive skin could not bear the carefully adjusted bar at the back of the fracture; a double splint, with bar at back of hip omitted, was applied. Remained in bed for two months; bore the modified splint easily; no pain after the first nine days. Was walking about in five months with two sticks; could get up and down stairs without assistance, and merely complained of weakness in the limb. The shortening was the same as at the time of the accident

though at that time there was no impaction and crepitus was evident on slight traction.

Case 8. J. Holding, aged 80 years, strong and robust for his years, middle height, wiry and active, tripped over a footstool and fractured neck of left femur. Shortening scarcely preceptible; no pain in the joint except on movement; hip splint applied; no uncomfortable symptoms from the first; commenced to walk in two months; is now lame, twelve months after the accident, but can walk a mile with a stick without much discomfort.

Case 9. Mrs. K., sent by Dr. Sheldon, aged 65 years, thin and emaciated, fell and fractured the neck of the right femur; complained of pain in the back, and on movement; no impaction; crepitus elicited without searching for it; one and one-half inch shortening. The hip splint was applied, but the skin over the sacro-lumbar region became tender and the double splint with interrupted bar over the hip was applied, and all pressure was easily taken off the back by placing two padded bolsters, one underneath the upper part of the splint and the other underneath the lower part. The patient made an admirable recovery after having been in bed two and a half months. She went about in a modified double splint, cut short at the knees; and in this way was enabled to swing herself along for three weeks when the appliance was finally removed. The shortening was reduced to three quarters of an inch by merely stretching the leg well out and fastening it by adhesive plaster to the posterior bar of the splint.

Case 10. A woman, F. K., sent by Dr. Owen, aged 43 years, slipped and fell fracturing the neck of the femur. (This is the youngest of the Thomas-Jones series, excepting cases of epiphyseal separation.) She had only three-quarters of an inch shortening; marked eversion; great pain; no injury to the great trochanter. Was placed in the hip splint and kept in bed for two months; then in the short splint for two months. Now, eighteen months after the injury, is able to walk many miles without discomfort. There is nothing in this case on later examination to suggest extra-capsular fracture; no bossing of the trochanter, nor any thickening.

If one were to consider only the cases above reported, and the other cases treated with the Thomas hip-splint, fracture of the neck of the femur would seem no more serious than fracture at any other part of the bony skeleton. As a matter of fact, however, when treated by the usual methods it becomes a very serious matter indeed. Cruveilhier, Colles, Lonsdale and B. Cooper denied the possibility of bony union in intracapsular fracture; Sir Astley Cooper admitted its possibility. Hamilton says: "It seems to me probable that, under certain favorable circumstances, this union will occur; these favorable circumstances have relation to several conditions, such as age, health, degree of separation of the fragments, whether impacted or not, laceration of the periosteum and capsule, treatment, etc. But such a combination of circumstances is probably exceedingly The most common results of this fracture are as follows: The bones are more or less displaced; the acetabular fragment absorbed as far as the head; the trochanter fragment appears flattened from pressure and friction; ordinarily the two fragments move one upon the other without the intervention of any substance; but often they become united, more or less completely by fibrous bands, which bands may be short or long, according to the amount of motion which has been maintained between the fragments while they are forming; or to the degree of separation which exists; permanent shortening is the invariable result, and a few succumb to the injury within a month or two." Of the sixty cases collected by R. W. Smith half died within the first eight weeks, and in all that lived the functions of the limb were permanently impaired. Stimson says: "Fibrous union after fracture is demonstrated by several specimens; ossification is merely the ultimate step in the involution of the granulations arising from bone, and it has been shown in the study of failure of union, of pseudarthrosis, that the arrest of the process is commonly due to lack of immobilization, defective contact, or constitutional peculiarities of which old age is not one. Prolonged complete immobilization of a fracture of the neck of the femur is practically impossible, accurate coaptation of the fractured surfaces is a matter of chance, and the reason of the habitual failure to get bony union is to be found in the inability of the surgeon to meet the two principal indications of treatment, coaptation and immobilization, not in any inability of the tissues themselves to do the work required of them. The common result of this fracture is permanent disability, more or less complete. The patient is sometimes bed-ridden because of the pain provoked by motion and the general feebleness which makes it impossible for her to get about on crutches; or limited use of the limb with the aid of a cane, or its place may be supplied by crutches. The foot remains everted, the limb shortened."

The relative frequency of fracture within and without the capsule is still undetermined; and inasmuch as the differential diagnosis is not made in the majority of cases, and inasmuch as neither prognosis, nor treatment are influenced by the location of the fracture, we will not consider the subject further.



Fig. 1.

The ordinary form of splint, with shoulder strap applied, and without fixative traction.



Fig. 2

The ordinary form of double splint. Fixative traction applied and shoulder strap omitted.

The symptoms of fracture of the neck of the femur are:

(1) Interference with function, which may be complete or only partial;

(2) Pain, located about the hip or extending down the thigh;

(3) Shortening, which may be only slight at first, but later may reach two inches;

(4) Eversion, almost universally present to some degree;

(5) Slight flexion and abduction; and

6) Crepitation, which may or may not be present, but should never be sought for. Post says (Trans. Amer. Surg. Assoc., 1883.): "The surgeon, in his anxiety to obtain a perfect diagnosis, moves the limb freely in all directions; he overcomes the impac-

tion, ruptures the cervical ligament, demonstrates beyond all doubt the existence of fracture, and effectually destroys all hope of reunion. For my part, I prefer an imperfect diagnosis for the surgeon and a perfect limb for the patient, rather than a perfect diagnosis for the surgeon and a useless limb for the patient."

Treatment.—The treatment now most in use is by weight and pulley and the long wooden side splint, with the foot of the

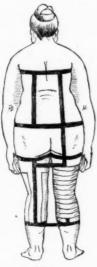


Fig. 3.

The modified double splint. Fracture of the neck of the left femur with too great tenderness at point of fracture to admit of any direct pressure. Section of main-stem omitted. Shows on left leg the manner of applying adhesive plaster for fixative traction.



Fig. 4.

The short or walking, splint with adduction wing.

bed somewhat raised. The amount of weight used varies with the fancy of the surgeon from very little to fifteen or twenty pounds; one of the latest writers, Stephen Smith, commences with from one to four pounds and increases according to the indications. To the side splint some add a perineal band to prevent the patient from slipping down in bed, the splint being long enough to rest against the foot of the bed-frame. Or, the perineal band may be used as a means for counter-traction,

opposed to traction made by an elastic strap, or tube, fastened to the outer surface of the splint and acting through a cord passing over a pulley at the end of the splint to the stirrup. The disadvantages in this plan of treatment are: that there are no indications for traction in impacted fractures, indeed traction for any other purpose than for anchoring the foot to the bed is positively contra-indicated; that traction by weight and pulley, or by the elastic tube, is acting constantly and uninterruptedly whether the patient be asleep or awake, and in an unimpacted fracture there is no guarantee that the fragments may not be separated to too great an extent for advantageous union. Only the constant attention on the part of the surgeon and the constant application of the tape-measure during the early period of treatment give any assurance that too great lengthening or unnecessary shortening has not taken place, and even under constant supervision there is no guarantee that the same relative relations are maintained between the fragments during sleeping and wake-The most serious objection, however, is that the long side splint only immobilizes laterally to any considerable extent, whereas the chief tendency to motion is antero-posteriorly; especially is this so in nursing the patient. It is not necessary to dwell upon the fact which we all know but too well, that it is quite impossible to adjust the bed-pan without inducing a certain degree of antero-posterior motion.

Remembering that most of our patients are helpless and fat old women, it is not surprising that sound union so rarely occurs when in the treatment there is a lack of direct fixation, a lack of fixative traction, and only the everchanging surface of the bed upon which to rest the fractured part—it is rather more surprising that union occurs at all; that union does at times take place would seem to indicate a very strong tendency to repair if the broken bone could but have a fair chance.

A very decided advance would seem to have been made in the recommendation of the plaster of Paris splint, applied to one, or preferably both limbs from the feet upwards and extending to the axillæ. But a moment's consideration will show that the advantage is chiefly theoretical, and counterbalanced by equally serious disadvantages. A fat old woman cannot be placed in the position for the application of plaster of Paris from foot to axilla without the risk of breaking up any impaction that may be present, or moving one fragment upon the other to an injurious extent in unimpacted cases; nor can the splint be applied without the help of a very considerable number of trained assistants; nor can it be done in most cases without an anæsthetic, an objectionable feature in the aged; nor is it usually accomplished without the limb being left somewhat flexed in the permanent dressing. In women the plaster splint is with difficulty kept free from urine; hidden points of irritation are complained of and cannot be ignored without the risk of a pressure-sore, and the splint cannot be removed and another re-applied without more or less serious harm to the fractured part. Outside of hospital practice the plaster splint can have no permanent place in the treatment of these cases. We have mostly to treat elderly women who are more often stout than otherwise, and it becomes very important that means be used which least hamper them, and that we refrain as much as possible from all purposeless restraint. In the Thomas hip-splint we have an apparatus which secures posterior support to the fracture, gives fixation without compression of the fractured region except posteriorly, allows the patient to be lifted with ease, does not interfere with the groin, favors cleanliness, admits fixative traction, can be applied without moving the patient and without assistance, and presents no difficulties after the initial application.

The splint is made from soft iron and consists of a mainstem, a chest-band, a thigh-band and a calf-band. The stem is an inch and a quarter wide and one-fourth inch thick, and in length reaches from the axilla to the calf of the leg, the length of the lower portion from the hip-joint to the calf of the leg being equal to that from the axilla to the hip-joint. In the part opposite the buttock two gentle bends are made, the lower somewhat backward and the upper upward so that the body and leg portions of the splint follow parallel lines from one-half to one inch apart, the body-portion being posterior to the leg portion. The stouter the patient, the more nearly do these parallel lines coincide, and in some cases the main-stem may be left entirely straight. To the lower end is fastened by one rivet the calfband, one-sixteenth by five-eighths inch, and in length an inch or two less than the circumference of the leg at this point. The thigh-band is one-sixteenth by three-fourths inch, and in length an inch or two less than the circumference of the thigh at its largest part; it is riveted to the main-stem just below the lower bend, so that when applied to the patient it comes well up to the perineum. The chest-band is three-thirty-seconds by one and one-fourth inch, and in length nearly equal to the circumference of the chest, being relatively longer than the other bands; it is fastened by one rivet after the upper end of the stem has been forged flat and bent back over it. This arrangement makes a fast joint and brings the stem between the chest-band and the skin. In each end of the chest-band a round hole is forged of at least one-half inch diameter. The splint is now bent to approximately fit the patient, padded on the side which is to come next the skin with a quarter inch thickness of felt, care being taken to leave no inequalities of surface, and then covered with basil leather put on wet and tightly drawn, so that when dry it will have shrunk sufficiently to prevent the cover from slipping on the iron. The splint is applied by opening out the wings of the bands looking to the uninjured side of the patient and then slipping them, followed by the stem, underneath the patient from the injured side; the wings which were straightened are bent again by hand and readily return to their former curves. A closer and more accurate adjustment of the wings may be made by the use of the wrenches; these will be found especially servicable in fitting the chest-band and in drawing in the other bands when the patient is very intolerant of any threatened movement or jarring. When it is possible it is better to fit the splint to the patient before she has been moved from the spot where she has fallen. The splint having been fitted, if retentive traction is not required, the limb is bandaged to the stem from the calf to the upper part of the thigh, rolling the bandage in the direction the opposite of the rotary deformity which may be present; then shoulder-straps are applied by taking a couple of yards of broad bandage, or a strip of muslin, looping it around the stem where it joins the chest-band, thence over the band and up over the shoulders and down to the ends of the chest-band where it is passed through the holes and tied, and then passed across the intervening space to the opposite hole and again tied. If retentive traction is desired the shoulder-straps are omitted;

in a thin patient the limb, after having been pulled down in the splint, can be secured by a figure-of-eight bandage fastened to the splint with a large pin passed through it and the covering at the back of the splint, but in a stout person this will rarely hold, the splint slipping down or the limb riding up; then we apply a broad strip of adhesive plaster to each side of the limb from the upper part of the thigh turning the lower ends outward and upward around the wings of the calf-band, where they are fastened by a strip of plaster passed entirely around the limb, the whole is then covered with a bandage as in the first instance. By this arrangement the limb is pulled upon only to the extent of correcting the actual shortening, and is held at one and the same length sleeping or waking, whether the muscles relax or are spasmodically contracted. The device aims to prevent motion in the axis of the limb; to prevent lateral motion by bending the limb in any direction; to do this without circumferentially constricting the region of the fracture, and to enable the patient to have the bed-pan adjusted without pain and without disturbing the relation of the parts. When the splint has been applied and the patient is in bed, the nurse should be instructed in certain manœuvres: The bed-pan is adjusted by passing an arm under both limbs at or below the knees and then lifting directly upwards, making an incline of the whole patient below the chest-band. By this manœuvre it is also more easy to smooth out wrinkles in the bedding and change the sheets than in the usual way. The skin pressed upon by the stem should be changed night and morning by pulling it slightly at first to one side and then to the other, and the patient should be inspected daily for pressure-sores by turning her on the sound side. To turn a patient upon the sound side, support the fractured limb at the knee with one hand and grasping the chest band with the other the patient is readily turned as a whole. The points most likely to suffer from pressure are those at the junction of the thigh-band and stem, the lower bend of the stem, and the junction of the stem and chest-band. Points pressed upon should be lightly dressed with balsam of Peru and protected from further pressure by padding above and below the point. If the pressure of the whole body portion of the stem is complained of, a small, thin mattress of hair, or a sheet

folded to several thicknesses, may be placed between the splint and the patient's back. Threatened hypostatic congestion is obviated by raising the head of the bed from one to three feet, and the patient is prevented from slipping down in the bed by tying the splint to the head of the bed.

In all cases obviously unimpacted and in all cases where the shortening is more than three-quarters of an inch fixative traction should be applied. All patients that are exceedingly feeble had best be placed upon the double splint. In all cases the splint should be kept on for from six to eight weeks after all pain has ceased; then the patient should remain in bed for four weeks longer without any treatment whatever, unless there be some positive indication to the contrary, in which case the splint is cut off at the knee and the calf-band riveted at this point, and the patient may then be permitted to go about with crutches. During the early period of treatment the diet should be restricted and regulated with the idea of avoiding a movement of the bowels for as long a time as possible. No cathartic should be given, for the bowels will surely move spontaneously by the end of the third week; after this the diet need not be restricted.

Thomas held the following to be the essentials of treatment:

- 1. To uninterruptedly and as effectually as possible arrest flexion at the hip joint.
- 2. To continue the treatment until the symptoms of genuine repair and soundness of the joint are diagnosed.
- 3. To obtain the best possible restoration circumstances permit, so that no lameness attributable to flexion be a permanent reminder of treatment.

And I quite agree with Stimson that the principle aim of treatment should be to keep the inflammatory reaction within the narrowest limits and to secure union at the earliest possible moment even if in a faulty position; that the first consideration is to keep the patient alive, the second to obtain good union, the third to get union in a good position.

Disability due solely to a shortened limb should not be classed as a bad result inasmuch as such disability may result from an impacted fracture—the profession being a unit in holding that the intentional breaking up of an impacted fracture is unjustifiable; but disability due to a sensitive and painful joint, and to

flexion which almost invariably accompanies such a condition, is curable, and should not, as it often is, be mistaken for delayed or non-union. Sound union in good position may still leave the patient for a time with a painful and useless limb, while entire absence of bony union may leave a painless and useful limb though still withal a short one.

There is a class of cases called by Thomas, "Simulated fracture of the neck of the femur," which may be referred to here. The patient suffers an injury to the region of the hip joint; no evidence of fracture can be made out at the time, but after the lapse of some days or weeks many of the signs of fracture may be found: apparent shortening, eversion and deformity, evident by the flexion test. These differ in no manner from the signs of simple inflamed hip joint, and can be diagnosed as not a fracture of the neck of the femur by the surgeon placing simultaneously the palms of his hands upon the patient's trochanters: when he will notice that in fractures the trochanter of the defective limb is slightly or distinctly prominent, and sometimes higher than that of the sound side; this differential diagnosis is not of much practical value, as the details of treatment are nearly alike, whether there be fracture or not; in these cases the fixative traction is not usually applied.

The fact that two cases, or several, have recovered under this treatment is of little significance, and it is not to illustrate brilliant results that these cases are reported. They are reported because I believe them (the first two) to be the only ones treated with this apparatus in this country, and because they serve as a text for that which is much more essential than the details of any method, namely, a consideration of the principles of the treatment of fractures involving or in the immediate vicinity of joints, principles equally applicable to fracture of the patella and olecranon.

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FIBROID TUMORS OF THE UTERUS.1

By JOHN HOMANS, M. D.,

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SURGEON TO THE MASSACHUSETTS GENERAL HOSPITAL.

R. BILLINGS, Chairman of the committee on the programme for this meeting, has asked me to say a few words in order to introduce the subject of Fibroid Tumors of the Uterus for discussion. My paper is not in any sense of the word a treatise or an essay on fibroid tumors, but simply an account of their natural history as I have watched them, their effect on the women who have had them, the means that may be employed when necessary to remove them, and the condition in which patients are left after operation. Nor have I thought it necessary to enumerate and tabulate all my own cases, although this might be interesting to the Association and instructive to me, but I have simply illustrated my remarks by citing a few descriptions applicable to the subject mentioned. If in concentrating what I have to say I have not carried out the wishes of the committee, I shall regret it.

I suppose it is unnecessary for me to define a fibroid tumor of the uterus. We all know them to be aggregations of normal uterine tissues in abnormal situations and masses. They may cause symmetrical enlargements of the uterus, or more or less one-sided enlargements; they may be in the walls of the uterus, or protruding towards its outside or towards its inner cavity; they may be incorporated with the uterus or connected with it by a broad attachment, or by a pedicle, or they may be entirely separated from it and get their nourishment from the vessels of the omentum or mesentery, to which they are adherent; they may grow under the broad ligament, or they may grow directly out into the general cavity of the peritonœum. Certain of them

¹Read before the American Surgical Association, May 31, 1892.

that grow near the cornu of the uterus are sometimes gradually extruded until they are merely connected with the uterus by the fallopian tube and broad ligament and have a pedicle as distinct as that of an ovarian pedicle. I have seen this state of things three times, and always on the right side. They may be dense, or ædematous, or filled with lymph spaces, or they may, in very rare instances, be fibro-cystic, having true cysts as distinct as those in an ovarian tumor, not the dilatations I have mentioned above in the substance of the tumor which are filled with clear, yellow or bloody fluid and are simply dilated lymph-spaces, but fibroid tumors, having true cysts on their outer surface, with thin walls, and filled with fluid of different densities. I am of the opinion that a certain number of tumors which have been described as fibro-cystic belong to the class I have mentioned as fibroids with dilated lymph-spaces. True fibro-cysts are very rare, and I should say a frequent operator would not meet with more than one or two in many hundred cases of uterine tumors.

In size these tumors vary from that of a mere dot to tumors weighing fifty or more pounds. Their rate of growth is generally slow, by which I mean that several years' growth will be required to produce a tumor the size of one's fist. They are very common. In order to settle this question for myself I have gone over my records of office patients. I find that I have seen in my office during the past fifteen years three hundred and seventy cases of fibroid tumors of the uterus, and, as I have seen many at the hospital and in consultation, I think I may fairly add one hundred and fifty more, making in all five hundred and twenty cases. When one surgeon has seen that number in fifteen years I think they may be called common.

These tumors are said to occur more frequently in the black than in the white race, while ovarian tumors are said to be more common in the whites than in the blacks.

Operations to relieve women of fibroid tumors are rarely necessary, judging from my own experience. Of these five hundred and twenty cases, I have operated only on sixty, or about eleven per cent. The conditions which should guide us in recommending removal of the tumors are, when they threaten life by hemorrhage; when they are unbearable from their weight or from the inconvenience they cause, particularly in the act of

stooping or bending, or from their position when they prevent a woman from sitting down; when in a young woman they cause distress, chagrin and shame from the alteration they have made in her figure; when they cause so much pain as to make life a burden; when by their presence they so obstruct the circulation as to cause swelling and cedema of the limbs, or interfere so much with the action of the digestive and eliminative organs as to cause emaciation and weakness; when they block up the pelvis so as to cause obstruction of the bowels; or when they have caused strangulation of the bowels; or when their pedicles have become twisted, and sometimes the whole uterus becomes twisted on its axis exactly as the pedicle of an ovarian tumor does, and presents the same symptoms, and requires immediate operation.

Death by hemorrhage is very rare. I have only known of three instances. Many women are blanched and anæmic and feeble, but they live, and most of them are relieved by curetting, or at times by electrolysis \grave{a} la Apostoli, or by the removal of a pediculated fibroid from the interior of the uterus, or by enucleating a half-extruded one.

The feeling of weight and inconvenience caused by these tumors are sufficient in some cases to call for their removal, and the sufferer has a right to demand operation even if life is not threatened, for surgery is not only to save life but to contribute to its comfort, and there is no class of cases in which the decision of the patient has more weight than in these cases of fibroid tumors. "I do not want to carry this thing any longer; it annoys me. I cannot stoop to button my boots, and I want it removed," said a woman to me. I had put her off several months, and she had had abundant time to think the matter over. I thought she had a right to decide the question of operation. I removed the tumor and she got well.

A growing tumor in a young woman from fifteen to thirty years old, which has distended the abdomen and is prominent and unsightly and causes remark, may be with propriety removed if the sufferer cannot bear to know how she looks, even if the tumor gives rise to no symptoms. It is her tumor and her life, and her body and her appearance, and she has a right to look like other women if she wants to.

Some large tumors interfere very little with respiration and nutrition, and cause but little ædema and emaciation, while others not so large cause great debility. Those tumors which have separated themselves entirely from the uterus are dangerous from the opportunities they afford for strangulation of the intestines, and should be removed. I have seen a case of death caused by some loops of the bowel becoming strangulated by slipping in between points of adhesion formed between a fibroid which had become wholly separated from the uterus and other loops, in a tumor nourished solely by its adventitious adhesions. Such loose-lying fibroids should be removed.

Again, a fibroid may threaten to render delivery impossible by the natural passages. At the same time, Nature will generally get these fibroids out of the way if you will give her a chance. I remember a case of this kind in the practice of Dr. John Benson, of Chatham, New Brunswick. It was a first labor; the tumor was so obstructive that Cæsarean section was seriously considered, but at length the tumor receded and allowed the head to pass. A few weeks after delivery Dr. Benson sent the lady to me. I opened the abdomen, turned the body of the uterus and both ovaries forward upon the pubes, split the capsule of the tumor and enucleated it from its bed, sewing up the rent in the uterus where its pedicle had arisen from the posterior part of the body near its junction with the neck. Recovery was uneventful. The tumor was about six inches in diameter and weighed two and a half pounds; it was growing, and if it had been allowed to remain would undoubtedly have rendered the next delivery impossible.

At the same time, as I have said, Nature will generally lift these tumors out of the way when the attending accoucheur would think natural delivery impossible. I remember a case where a large fibroid filled the vagina at the beginning, or just before the beginning of labor. I could not move it when pressing on it with my hand, even with a purchase against the wall of the room with my foot, and yet in twenty-four hours Nature had pulled that tumor up and had pushed the os, through which one could feel the child's head down into the vagina.

I remember another case of pregnancy at five months, where I advised non-interference, but another gentleman said the tumor

must be removed, as delivery at term would be impossible. This was done, and the woman died in two hours. Another case I remember where a practitioner produced labor somewhat prematurely and ruptured the uterus, and the woman died. Both of these cases could not have done worse if they had been let alone, and they might have done better.

Sometimes these tumors, when quite small, by their position make it impossible for a woman to sit down with comfort. One of my patients said she felt as if she was sitting on a spool, and that she had to stand or lie down to have any comfort. She was sent to me by Dr. W. G. Kimball, of Worthington, Mass. A fibroid about the size of a horse-chestnut, on the posterior and left side of the fundus, was tied and burnt off. Another near it, the size of a boy's marble, was torn off. There was no drainage. Rapid recovery and complete relief followed.

The solid fibroid tumors rarely have any adhesions, and are removed without much difficulty after a little practice. The true fibro-cystic tumors are very rare. In the five hundred and twenty cases mentioned above, I am only sure that eight were fibro-cystic—only about 1.3 per cent. Of these I did not remove any successfully. In all the operations I was unable to separate the cysts from the bowels and other peritoneal structures. One woman recoverd from an incomplete operation. The others all died. Of course, there may have been a cancerous element in some of these tumors, as very few of them were followed by an autopsy. Most of these operations were attempted many years ago, when my manual dexterity was not as much developed as it is to-day. But I still regard true fibro-cysts of the uterus as very rare, and, as a rule, very dangerous in their removal.

An extraordinary case of twisting of the uterus as the pedicle of a large fibroid tumor of many years' existence was reported by me (American Journal of Obstetrics, Vol. XXV., No. 3, 1892.) The uterus was twisted one and one-half times on its axis, and the blood supply was cut off from the tumor and from the ovaries and tubes. The case was fatal, no operation having been done. There was general peritonitis and lobular pneumonia. How this twisting of a great solid tumor and of the uterus could have happened is incomprehensible to me. A great solid fibroid tumor, weighing at least six pounds, with both

ovaries, tubes and broad ligaments had become twisted on its axis one and a half times.

The natural history of ninety per cent. of fibroid tumors is to grow to a size to reach the umbilicus, or to reach higher or lower than this point, and then to remain stationary, and after the menopause to become cretaceous and atrophied. Some of them, I think, shrivel up almost entirely, while others remain as large as a cocoanut without giving rise to great inconveniences. About ten per cent. of them require removal for one of the various reasons I have mentioned in the earlier part of this paper; others atrophy of themselves, without any treatment being employed. A large number of them are discovered by an attending physician, the women being totally unaware of their presence, though they may have been in the womb for many years.

Patients with fibroid tumors present themselves between the ages of twenty and sixty, rarely before or after these periods of life. I find that the average age of those on whom I have found it necessary to operate is thirty-nine years. One-quarter of them were about thirty-four years old. My youngest patient on whom I have done abdominal hysterectomy for a fibroid was eighteen and my oldest sixty-five. Of sixty cases, one was sixty-five, one sixty-three, ten were between fifty and fifty-two, one was eighteen; only three were between twenty and thirty, while forty-four were between thirty and fifty years of age.

The treatment of these cases may be by drugs or by surgery, or by both, or by letting alone. The most common drug used is ergot. Alone, as a rule, it is ineffectual; combined with curetting it helps to stop hemorrhage. The treatment by high doses of electricity sent through the uterus and tumor à la Apostoli, I have written upon at length elsewhere. Suffice it to say that it sometimes arrests hemorrhage, almost always relieves pain and gives strength, but rarely diminishes the size of the tumor.

Removal of the ovaries for the cure of fibroids, particularly bleeding ones, was at one time extensively practiced. I have practiced it but four times. In one woman forty-four years old the tumor disappeared in a few weeks and menstruation ceased

¹Boston Medical and Surgical Journal, Vol. cxxiv, March, 1891.

at once. In another, thirty-three years old, the catamenia gradually ceased after three years and the tumor remained about the same, when I last heard, in 1887. In another woman, thirty-four years old, the operation was done on August 5, 1885. By May, 1886, she had gained twenty-four pounds in weight and was well and strong. From the time of the operation till November 10, 1885, a period of three months, she flowed incessantly, but only slightly, nothing in amount to what she had done before the removal of the ovaries and tubes. From November 10, 1885, till February 24, 1886, the flowing wholly ceased. Since that time, till May 13, 1886, she flowed continually, but not one-tenth as much as she used to. The tumor was somewhat diminished. I have not seen her for six years.

Another one, thirty-six years old, was not at all relieved by the operation. The tumor reached to the umbilicus, and the flooding was severe. I removed the ovaries and tubes on January 21, 1886. Two years later the tumor had descended into the cavity of the uterus, and was removed *per vaginam*. Of course, after this the hemorrhage ceased. I have seen in another case, not my own, the tumor grow enormously after removal of the appendages, and I am inclined to regard the method as unreliable.

Curetting the interior of the uterus often cures the hemorrhage completely, and this curetting I follow by wiping the interior of the uterus with tincture of iodine. At the present time the surgical treatment is almost wholly by removal of the tumor, with or without the uterus. The kind of operation to be adopted has and will vary with the particular case and the particular operator. In general, the two varieties of the operation are described as intra- or extra-peritoneal treatment of the pedicle. Of course, if the tumor has gradually been extruded more or less into the cavity of the uterus, it should be enucleated and removed under the most careful antisepsis. Such protrusion will invariably be preceded by great hemorrhage, and will give abundant warning of the necessity of interference. Quite large tumors are extruded in this way.

Tumors which have carried the fundus of the uterus to the umbilicus may in the course of two or three years be removed per vaginam. But tumors requiring removal, which do not thus

become extruded, must be removed by abdominal section. There are several ways of finishing this operation. Sometimes one can close the wound in the uterus by stitches and leave no pedicle. but simply a sutured wound, and then close the abdominal wound. Sometimes the base of the tumor and body or neck of the uterus is compressed in a small ecraseur or serre-nœud, and a long pin passed through the stump holds it outside the skin of the abdomen; this is called the extra-peritoneal treatment of the pedicle by Kæberle's serre-næud or some modification of that instrument. Sometimes the stump is simply tied around as the pedicle of an ovarian tumor is, and is dropped back. Sometimes the stump is turned into the vagina after being ligatured; this is called the intra-vaginal treatment of the stump, and is, of course, extra-peritoneal. All the different modes of treatment depend for their fundamental success on asepsis and on securing the vessels of the broad ligament, no matter in what way the pedicle or neck or body of the uterus is ultimately disposed of. I will not enumerate the different methods. The members of the Association are referred to ingenious methods of operation described in the American Journal of Obstetrics, particularly in the contributions from Chicago during the past few years, and to the foreign journals, particularly the German ones. Time would fail me and this introductory paper would become a monograph on the different operations for removing fibroid tumors of the uterus by abdominal section if I should describe the different procedures employed.

The condition of most of those from whom fibroid tumors have been successfully removed by laparotomy is very comfortable. Some of them, I do not know exactly what proportion, suffer from what they call "hot flashes," by which they mean a sensation of heat rushing to their heads. This is extremely uncomfortable. In some cases it takes place every few minutes, in others at longer intervals. I do not know any way of relieving this distressing symptom. Others get extremely fat. A certain proportion, particularly those in whom the pedicle has been treated extra-peritoneally, suffer from ventral hernia. In all cases, however, in which the operation was really necessary the state of health is much ameliorated, and the individual is very comfortable.

Sometimes the bladder is cut off by the wire ecraseur, owing to its not having been sufficiently dissected off from the tumor, but in the only case occurring to me the bladder healed in a few weeks by keeping it drained with a Simm's catheter, and the accident has caused no subsequent trouble, the bladder having been perfectly normal ever since the operation some ten years ago.

The length of the incision does not complicate an operation, provided there are no adhesions. I remember one extending from the sternum to the pubes, in which a tumor weighing fifty-three pounds was removed. The scar has remained sound, and there is no hernia.

Very rarely insanity follows the operation of removing a fibroid by laparotomy, as it sometimes does other surgical operations. Attacks of insanity that I have seen after surgical operations, such as ovariotomy for instance, come on with a normal temperature when recovery is taking place, and the insanity becomes more fixed and established as convalescence merges into health. One of my patients was an elderly person, sixty-eight years old, who recovered rapidly from ovariotomy; another was much younger, being only twenty-five years old. I have never seen insanity after hysterectomy.

Tetanus I have seen twice in cases of other operators, but have never myself had an instance of it after hysterectomy. I have, however, had one case after an ovariotomy.

I invariably see that my patients who have recovered from abdominal hysterectomy are fitted with a firm abdominal supporter, and impress upon them the necessity of being careful about carrying heavy loads or straining themselves.

EDITORIAL ARTICLE.

TERRIER AND HARTMAN ON THE IMMEDIATE AND ULTIMATE RESULTS OF VAGINAL HYSTERECTOMY FOR CANCER OF THE UTERUS.¹

A point often lost sight of in the study of the therapeutics of cancer is the ultimate result of the operation performed for its radical cure. Several years ago one of these surgeons published the results of his first eighteen hysterectomies, and has kept track of them and included their present condition in this article.

Eighteen new cases are also reported, making a total of thirtysix hysterectomies with eight deaths, a mortality of about 22 per cent.

In both the old and the new series there was an error of diagnosis in one of the cases, therefore reducing the total number of hysterectomies for cancer to seventeen in each set, or a total of thirty-four with a mortality for cancer, as both these patients recovered, of about $23\frac{1}{2}$ per cent.

The four deaths in the first series occurred in first case from hemorrhage on the seventh day; the second and fourth died in forty-eight hours of shock and hemorrhage, and the third on the third day of shock.

In the second series the deaths were due to shock in a case where the cancerous growth had involved the bladder; twice to peritonitis. In the first one of the peritoneal cases a pair of forceps had pinched a loop of small intestine causing a perforation, and in the second the uterine body was everywhere adherent. Many pairs of forceps had to be employed, and the peritonitis seemed to originate from a pair of forceps that had been used as sponge holders, being mistaken for a pair clamping a vessel and being left sponge and all in the wound.

¹ Revue de Chirurgie, April, 1892.

In the fourth and last case death resulted on the fourteenth day, when the patient seemed on the high road to recovery, from phlebitis of the lower limb. There is no death from hemorrhage in the second series of cases, owing to the abandonment of the ligaturing of the broad ligament and the employment instead of continued forci-pressure.

In the last operations instead of trying to include the whole of the broad ligament in a single pair of forceps, two and occasionally three were employed. The ligament being grasped in the first pair, this portion is cut through, thus lowering the uterus a little and rendering it comparatively simple to include the remaining portion of the ligament in the grasp of the second pair of forceps. Sponges have been entirely abandoned, a current of water over the wound being enough to cleanse the parts.

The granulating masses projecting into the vagina are first curetted in order to clear the field of operation more thoroughly and dispose of any tendency to obstructing hemorrhage from that source. In considering the ultimate results of the operation, two cases in the first series where the recto-uterine cul-de-sac was opened during curetting and the uterus removed should not be included.

In a third case the forceps were fixed upon friable and suspicious tissue.

In one of these cases the patient committed suicide shortly after leaving the hospital, the other two survived eight and nine months.

Ten patients alone remain in whom the operative interference seemed at the time to be more serious than the condition demanded. Of these two are well without any trace of recurrence, after six years and four months for one, and four years and six months for the others. Relapse occurred in the eight others at different times between one and one-half months and two years.

In the second series there are also three incomplete hysterectomies. In one this was necessitated by the opening of a cul-de-sac in the course of curetting and a part of the thickness of the bladder wall was also resected.

This patient was much benefited and was still well four months after the operation. The other two lived two and one-half and fourteen months respectively. One of the ten upon whom the complete operation was performed has been lost sight of, but of the other nine, five are in good health. Three of these are free from relapse at from three years to eight months after the operation. The other two are free from all symptoms but have a small suspicious nodule at the side of the vaginal cicatrix. They have gone for three years and five months and ten months, and if their statements alone had been accepted and no examination made they would have been considered as completely cured.

Time and the increased number of cases only confirm the fact that: First—Vaginal hysterectomy for cancer is a serious operation.

Second—Vaginal hysterectomy does not seem to be less serious when it is partial, than when it is complete, so the latter operation is advised whenever the uterus is mobile, even when the vagina is involved for, this may be operated upon at another time.

Third—Relapse is frequent, 70 per cent. and often rapid, but may not manifest itself by signs noticeable to the patient until considerable time has elapsed, (6 months, 2 years.)

Fourth—30 per cent. of the patients who survive *seem* to be completely cured, even when the malignant character of the disease has been fully established clinically and histologically.

M. Bouilly¹ says that this operation continuing to be very serious and dangerous, is only justified by the malignant course of the disease.

In 1888, he had performed 30 vaginal hysterectomies, of which 29 were for cancer, with 7 deaths. Since then he had done 21 other cases, making 50 vaginal hysterectomies for cancer of the uterus performed since 1886, with 16 deaths. Anong the 34 recoveries from the operation 6 have remained well for a period varying from four years and three months to fifteen months. Two patients had a recurrence after three years and five months and three years and four months. 4 have died after more than two years, and 4 have been lost sight of. Among the 18 others recurrence has been noticed in from two years to eight months. In 15 cases in which total extirpation was impossible, a partial removal was undertaken, and in all a recurrence followed very rapidly.

¹Societe de Chirurgie. Revue de Chirurgie, Jan. 10th, 1892.

From the final results it is incontestable that a considerable number of these cases have been largely benefited by the operation. The results obtained in cancer of the uterus do not differ especially, therefore, from those of cancer of other organs, the tongue, or the rectum for example, and the same principles should govern the decision in regard to interference. He advised not operating when total removal is impossible and complete vaginal hysterectomy when the cancer is limited.

In M. Segond's 33 hysterectomies of which 25 were for cancer of the cervix and 8 of the body of the uterus there were 7 deaths all among the cervical cases. Eight of the cases having been operated upon within six months were not considered; of the remainder (18) seven had suffered recurrence, four of them dying in less than a year, and the other three had only been operated upon about eight months ago.

M. Verneuil had recently seen a woman who was operated upon in 1889 for a cancer of the cervix in whom a partial amputation was done, and where the microscopic examination had revealed an epithelioma. He also cited another case that was well for nine years. The least time of survival in the partial amputation was 21 months which he considered better than in total hysterectomy.

SAMUEL LLOYD.

INDEX OF SURGICAL PROGRESS.

HEAD AND NECK.

Pyoktanin in Epithelioma of the Lips. By Professor ALEXANDER A. BOBROFF, (Moscow, Russia.) The author briefly relates two cases of epithelioma of the lower lip in peasant men who declined any surgical interference and hence were treated by a zemsky practitioner with parenchymatous injections of a 2 per cent. solution of blue pyoktanin. In both, the injections induced softening of the neoplasm, formation of small abscesses, disintegration and elimination of nodules, and consecutive shrinking of the tumor with cicatrization. In one of the patients (seen by the author about the termination of the pyoktanin course), the whole periphery of the ulcer proved to have cicatrized, and only two nodules could be detected at some distance from the side of the lesion. In the other man about 3/3 of the edge was found cicatrized, while along the remaining 1/3 of the periphery some cancerous nodules were still present. On the whole, the author believes that "there is something in it" which justifies further experimentation. [Prof. V. I. Küzmin, of Moscow tried methylviolet in two inoperable cases, in one of which he had to deal with recurrent medullary cancer of the cervical lymphatic glands (developing in 3 months after the removal of the tongue on account of the disease), and in the other with recurrent carcinoma of the hyo-maxillary triangle and maxillary and parotid regions. In both of the cases there was observed partial softening, suppuration and disintegration, but on the whole the morbid process continued to steadily spread ever further. The author concluded that the method "has no serious value whatever." Prof. N. V. Sklifosovsky similarly mentions two cases of melanotic sarcoma in which the neoplasms continued to actively grow in spite of the pyoktanin injections. Dr. I, D. Sarytcheff also failed to check the progress of malignant disease in two cases, both of them being those of women with recurrent cancer.

In common with Prof. Sklifosovsky, Dr. Sarytcheff found the injections caused a vivid pain. In the Provincial Medical Journal, April, 1892, p. 177, Dr. F. F. Burghard, of London, contributed an instructive paper on the question, with 8 cases from his practice. Cft. also the following papers on the subject in the Supplement of the British Medical Journal: Le Dentu's and W. Meyer's, 1891, May 16, p. 158; Quenu's, June 27, p. 204; Von Schlen's, July 5, p. 30; Lodigiani's, and M. Belloths's, Aug. 22, p. 62; Zielgien's, Nov. 28, p. 174; Ceron's 1892, March 5, p. 40. An important contribution concerning antiseptic properties of pyoktanins, by Prof. Roswell Park, may he found in Annals of Surgery, July, 1891, p. 66. Vide also Title's paper, 1851D., August, p. 158.—Reporter.] Transactions of the Moscow Chirurgical Society for 1891, in the Khīrürgitscheskaia Letopis, 1892, Vol. II. No. 1, p. 21.

VALERIUS IDELSON (Berne).

ABDOMEN.

Laparotomy Under Cocaine. By Emory Lamphear, M. D., Ph. D. (Kansas City, Mo.). When admitted the patient was in extremis—cadaverous, weight less than 80 pounds and at the gate of death from starvation. Upon the evening of admission the abdomen was carefully scrubbed and shaved and a pad of moist bichloride gauze applied. On the following day a gastrostomy under local anæsthesia from cocaine was performed. One-half drachm of a 4 per cent. solution was injected in eight places into the subcutaneous areolar tissue along the proposed line of incision. As soon as the analgesic effect was established the usual operation was made, and without any pain or even sense of discomfort on the part of the patient. The only disagreeable symptom was a slight nausea when the left lobe of the liver was turned up to allow the stomach to be drawn up into the wound. The operation lasted twenty-two minutes.

How much longer the operation might have been prolonged without discomfort to the patient is a question of interest. But as a large number of the abdominal operations can be made within twenty minutes it is not so important as might at first be supposed. Besides

the fact that the primary depressant effect of a general anæsthetic was avoided by the use of cocaine, there were two other points of much importance in this case, viz.: the absence of vomiting that nearly always follows chloroform or ether, and especially the absence of shock. There was a total absence of anything like shock, and if this be found to be a general rule an immense gain may be made in sewing up stab or even gunshot wounds of the intestine (as well as in other numerous abdominal operations), by the use of local instead of general anæsthesia.—New England Medical Monthly, June, 1892.

GENITO-URINARY ORGANS.

Operation for Hypospadias by Scrotal Flap. By Prof. A. LANDERER, (of Leipzig). L. applies the plan recently set forth by Rosenberger for relief of epispadias to defects on the under surface of the penis. He makes a longitudinal, fresh surface on either side of the urethra, continuing this on the scrotum to a length corresponding with the hypospadias. The penis is now doubled on the scrotum and closely sewn to it along the denuded lines. When union is complete the scrotal flap is dissected up, thus forming the floor of the urethra. The skin edges are then united in the median line. L. advises that the second stage be delayed until the expiration of six to eight weeks. Silver sutures can be employed in bringing the scrotal edges together, grafting may be resorted to if necessary. We are left in doubt as to whether or not there will be a troublesome growth of hair in the urethra.

For illustrations see original.—Deutsche Zeitschrift für Chirurgie, Bd. 32, s. 591.

Charles A. Powers (New York).

Litholapaxy in Children. By Dr. L. P. ALEXANDROW (of Moscow). A. has performed this operation 32 times on children of from 1 to 14 years with five deaths, three occurring as direct result of the procedure. He would employ it in all cases in which the urethra has a calibre of 14 Eng. and the stone a diameter not exceeding 2.0 to 2.5 cm. When these conditions are wanting he would resort to sectio alta.—Deutsche Zeit. für Chir., Bd. 32, s. 525.

CHARLES A. POWERS (New York).

Traumatic Perineo-Rectal Fistula. By Dr. A. K. VALK (Smorgon, Russia). The writer records an interesting case of the kind, ending in a spontaneous recovery. A peasant-girl of 14, while coming down from a nut tree, struck against a dead bough, which penetrated deep into her perineum, causing agonizing pain. With great difficulty she managed to disentangle herself, the withdrawal of the foreign body being immediately followed by a profuse hemorrhage and, on the next day, by escape of gases and fæcal matter from the wound. On examination four days later, the author found a gaping vertical wound, three centimetres long, running from the sphincter along the raphe and higher up deviating to the right to involve the posterior third of the right major labium. A similarly vertical wound was present on the anterior wall of the rectum, it was large enough to admit a forefinger and proved to be communicating with the perineal laceration, the sphincter ani, vulva and hymen remained intact. The patient's parents refusing any operative aid, the treatment was of necessity limited to such measures as absolute rest, initial dose of a purgative, restricted diet (milk with bread), internal administration of opium, enemata every fourth day, and daily washing out and disinfecting the wound. On the twenty-sixth day of the treatment the rectal fistula perfectly healed. thirty-first the girl was discharged with a shallow soundly granulating surface at the site of the perineal wound, measuring about 0.5 centimeter in length.—Meditzinskoië Obozrenie, No. 2, 1892, p. 119.

VALERIUS IDELSON (Berne.)

ABSCESSES AND TUMORS.

Treatment of Spinal and other Tubercular Abscesses. By Frederick Treves, F. R. C. S. (London). An incision is made into the abscess at the most convenient spot, and wherever possible at the most dependent point. It should be so placed as to command all parts of the abscess, and to allow of access to sound skin. The pus is allowed to escape and the abscess cavity is then washed out with a hot solution of corrosive sublimate of the strength of 1 in 5000. For this purpose a Leiters irrigator of the largest size, and suspended at a height of twelve feet is convenient. Many gallons of the solu-

tion are required. When the fluid returns clear the fingers are introduced into the cavity, and the caseous semi-solid matter which exists in such quantity in these abscesses, and which is not wholly removed by flushing can be dislodged. By means of the fingers also septa in the cavity may be broken down, diverticula may be opened up, and by the aid of the finger-nails a considerable quantity of the smooth, slimy lining membrane of the abscess may be removed. Repeatedly the cavity is flushed out with the warm solution. The lining wall of the abscess is now carefully and thoroughly scraped with a Volkmann's spoon until the whole surface has been laid bare. Every once in a while all the debris is flushed away. After the scraping and flushing have removed all signs of the lining membrane, comes the most important part of the operation—the rubbing of the abscess wall with sponges and the thoroughly drying of the cavity. By means of sponges on holders the whole of the abscess wall is thoroughly rubbed, and it is surprising what a quantity of inflammatory material in the form of the slimy lining membrane, and even cheesy pus, comes away upon these sponges. The sponging process is tedious but it leaves the cavity practically dry. The abscess cavity is now a raw space almost comparable to that which would be left after the removal of a large and adherent tumor. The oozing of blood, which is at first considerable, soon ceases, and the last sponge should be withdrawn practically unsoiled. The incision is then completely closed with silk-worm gut sutures. No antiseptic is introduced into the abscess cavity and, of course, no drainage is employed. As [far as possible the abscess in obliterated by properly placed pads. An abscess which has become thoroughly septic may be treated in the same manner.

In spinal abscesses certain difficulties arise, the chief of which depend upon obstacles in the way of the complete evacuation of the abscess and the complete removal of its lining membrane. The depth of the cavity, its great length, and its position within the abdomen (assuming it to have followed the psoas muscle) place difficulties in the way. In case of recurrence of the abscess after it has been thoroughly dealt with by this method, the cavity should be injected with a solution of iodoform if it is so placed that aspiration may be safely performed.

-London Lancet, May 21, 1892.

SAMUEL LLOYD (New York).

Treatment of Inoperable Malignant New Growths by Pyoktanin. By Prof. Petr I. Diakonoff (Moscow, Russia). The author details three interesting cases, one of which is that of a peasant man of 50, with recurrent cancer of the right zygomatic bone and lower edge of the adjacent orbit. The new growth measured 5 x 5 centimetres, and was immovable and dense, its centre being occupied by an easily bleeding ulcer, rising nearly one centimetre above the surface and discharging a muco-purulent matter. The nose was œdematous, while the soft tissues below the tumor were infiltrated sufficiently densely to interfere with opening the mouth. During the period of June 8th to Aug. 28th, there were given 18 injections of an aqueous solution of methyl-violet. The strength being gradually increased from 1 to 1000, to I to 300. The quantity of the fluid at a sitting varied from I to 4 grammes, the solution, being injected both into the ulcer's base and along its periphery. The discharge at first increased, but later on, after a few injections, considerably lessened. After a second sitting the tumor began to gradually decrease in size, after a third, opening the mouth became freer, and nasal cedema disappeared. The patient (who was compelled to interrupt the treatment on account of some urgent family affairs) left the hospital on the 82d day since the first injection when the following changes could be registered. The ulcer had become quite clean and ceased to bleed and protrude, while there set in a sound cicatrization along its whole periphery; the infiltration of the cheek and lips disappeared, opening the mouth became quite free, and the patient's general state improved. A second patient was a badly nourished and sickly woman of 41, with a very hard cancer of the right breast, involving the whole organ. The skin was universally adherent and traversed with frequently and profusely bleeding ulcers. There were present, further, numerous nodes and nodules in the left mamma, as well as over the sternum and ribs, and a considerable infiltration of the axillary and supraclavicular glands on both sides. The patient was suffering greatly from incessent pain (which did not yield to morphine or any other narcotics), obstinate sleeplessness, anorexia and great prostration. At first a 1 in 500, later on a 1 in 300, solution of pyoktanin was employed, the dose injected at a séance varying from 1 to 6 grammes, and the injections being repeated

twice a week. Only the mammary tumors were treated in this way (all the remaining were left alone). In all 52 injections were given in the course of six months (up to the date of the communication.) After two séances hemorrhage ceased and never recurred, after a 3d the sternal tumor markedly diminished, while shortly afterwards pain totally subsided, and the cutaneous nodules, mammary tumors and glandular infilration commenced to steadily decrease. The ulcers partly healed partly became covered with crusts. The patient's sleep, appetite and general strength markedly improved. Some relapses occurred from time to time, but the right mammary tumor still continued to decrease, though rather slowly, up to the publication of the paper. The third patient, a woman, aged 58, had a recurrent fibrochondrosarcoma of the right parotid, involving the masseter, mastoid process, and suprahyoid region, and accompanied by œdema of the surrounding soft parts, auricle, facial paralysis, absolute deafness on the affected side, salivation, sensation of foreign body in the pharynx, etc. Exactly the same treatment was adopted as in the preceding case, the total number of injections, made during the period of Aug. 15th to Nov. 6th, amounting to 23. The parotid tumor markedly decreased. cedema of the face and ear disappeared, salivation and the sensation about the pharynx diminished, the hearing power of the right ear markedly improved. The patient's general condition, however, continued to grow worse, and she ultimately died from a metastasis into the liver. Analyzing his cases and reviewing the international literature on the subject, Dr. Diakonoff comes to the conclusion that 1. blue pyoktanin actually possesses a power of destroying malignant new growths, though its action is not energetic. As Prof. Mosetig Moorhof has pointed out, the drug's modus agendi consists in inducing fatty degeneration of the neoplasms, the products being partly absorbed, partly forming pus, etc. 3. Contrary to the statements by Quénu and A. Williams (of St. Louis), methyl-violet is very diffusible. 4. The injections do not give rise to any pain beyond that from puncture. 5. The remedy is harmless. 6. The method is indicated solely in inoperable cases of malignant new growths. - Khirürgitcheskäia Letopis, 1892 Vol. II, No. 1, p. 3.

VALERIUS IDELSON (Berne).

Suppuration. By G. H. Roger. Suppuration can be produced either by one of the numerous microbes, whose principal but exclusive quality is pyogenic, or by other agents more virulent, but still accidentally acquiring this quality, or by simple saprophytes. Apparently, the results of recent experimentation go to prove that it may be produced by most of the well known microbes.

Graevitz and Bary have done the best work in determining whether pus can or cannot be produced by the introduction of aseptic substances into the body without the presence of bacteria. They have proved that in rabbits suppuration without microbes cannot be induced, while in dogs a solution of nitrate of silver or concentrated ammonia will cause abscess. But the most marked result was obtained by the use of terebinthine. This substance and mercury are strongly pyogenic for dogs, while for some other animals (rabbits, etc.) they are simply phylogenic.

In his normal condition man is not a very favorable medium for pyogenic microbes; for their development the resistance of the tissues must be lessened either in consequence of a traumatism or local alteration, or the general health must be impaired in some way. It is fortunate this is so, since pyogenic microbes are everywhere about us. They are constantly found in the skin, in the mouth and intestines, and while harmless generally, expose us to constant danger. In the course of infectious diseases suppurations often occur and always in localities previously attacked by these microbes. This explains the secondary suppurations in different skin diseases, and in consumption the destruction of the lung allows the pyogenic microbes to add their action to that of Koch's baccillus, so that at the same time the patient may be pyohemical as well as phthisical. In wounds of the skin and sores it is almost impossible to prevent their appearance. In the secretions of wounds where there has been perfect union and no suppuration Bloch has often found pyogenic agents.

All these facts prove that it is a great mistake to believe that a pathogenic microbe introduced into an organism causes disease and always the same disease. That such a result should follow there must be an organic consent and the clinical character will depend less on the invader than on the subject invaded.

Gangrene has the same microbic agents as suppuration, the clinical difference is due to the patient. Suppuration is therefore a morbid process which develops oftenest when the organism has no strength to resist the pyogenic agents which everywhere attack it. The causes favoring it are of two kinds, a local alteration or general modification of the organisms. It is produced in all cases by a reaction of the organism, diapedesis and karykinosis, against certain irritating substances whether they be originally microbic or not. The causes are therefore multiple, the mechanism always the same.

But if the possibility of an aseptic suppuration has been demonstrated by numerons experiences, the result has only a theoretical interest. It explains the mechanism of suppuration, it has a primordial importance from a pathological and physiological point of view: next from a surgical standpoint, it can be stated that there is no pus without microbes, but, there is no microbe of pus. Most bacteria can under certain circumstances acquire pyogenic properties. Revue de Chirurgie, Dec., 1890.

SAMUEL LLOYD, (New York.)

BONES .- JOINTS .- ORTHOPÆDIC.

"Researches on the Spinal Curvatures of Children while Sitting. A Study of the Mechanics of the Sitting Posture." By WM. Schulthess. Dr. Schulthess based his paper on examinations of fifty children made by means of his measuring apparatus. Each child was measured standing, sitting at ease, and sitting erect. Two curves were taken in each position, one to show the antero-posterior, the other the lateral deviation of the vertebral spines. The author describes and classifies these curves and notes the effect on each of a change from one attitude to the other.

He found that almost all children exhibited while sitting at ease a marked kyphosis which increased in proportion to the time they remained seated, the most prominent point being in the great majority of cases the first lumbar spine. If an erect sitting position was assumed these curves showed a decided flattening out and

¹Zürich Zéitsch für Orthop. Chir. 1 Bd. 1 Heft. 1891.

generally two projections instead of the one long kyphosis, a slight but evident lordosis appearing at the dorso-lumbar junction. In most of these cases there was also a slight inclination forward of the whole spine. As compared with a standing position the lumbar lordosis was always less and the dorsal spine more flat.

The inclination of the pelvis was always changed in these cases as well as that of the spine itself, and the author proved that not even by the greatest muscular effort could this inclination be made as great in the sitting position as it was habitually in standing at ease. The difference amounted to from five to ten degrees.

While sitting at ease the lateral deviations were in one-half the cases more marked than they were when the child stood, and a still greater number showed this increased deformity in an erect sitting position.

The author recommends a separate consideration of the young and adult types on account of the occupation curvatures developed in the latter. He notes considerable differences also between the curvatures seen in boys and girls.

The very great pliability of the child's spinal column made it possible to get the same curvature in sitting from the most diverse standing positions.

The chief factors in producing these changes in the spinal curves were found to be the change in the position of the centre of gravity, and the loss while sitting of the compensatory motions at the hip and ankle so useful in maintaining equilibrium. The latter fact made it clear why slight asymetry of single vertebra had a much greater mechanical effect on the column in sitting than in standing.

Dr. Schulthess advised in view of these studies that children should be allowed to sit less. The kyphotic position generally assumed interfered also with respiration and circulation. While an erect sitting posture removes these objections it causes an abnormal antero-posterior curvature and increases any lateral deviation which may exist.

T. HALSTED MYERS (New York).

SURGERY OF THE TONGUE.1

By N. P. DANDRIDGE, M. D.,

OF CINCINNATI.

IN THE following paper on the "Surgery of the Tongue" I shall confine myself to a discussion of operative procedures in malignant disease, and it may be well to first briefly review our knowledge of lingual cancer. This can be the more satisfactorily done as there is agreement in the main by most authorities upon all the essential points. With scarcely an exception, cancer of the tongue appears in the form of an epithelioma. It affects males more frequently than females, it occurs most often between the ages of 40 and 65, and is more frequently situated upon the edge than the dorsum, and on the right than on the left side. It generally implicates the neighboring glands but is seldom followed by metastatic deposits. It runs its course in an average of about a year and a half, and tends to a fatal termination by exhaustion from repeated hemorrhages, inability to take sufficient nourishment and from the swallowing of contaminated discharges, and from pneumonia or septicæmia. In a large proportion of cases it develops from an indifferent lesion which has been subjected to some form of continued irritation, and in only a limited number of cases can it be traced to any previous cancer in the family. The growth most frequently occupies the surface of the tongue but may occur in the form of an interstitial growth; ulceration in both forms occurs early. In the Middlesex Hospital Report for 1888, all the cases of cancer which had been admitted for the previous seven years are carefully analyzed; -744 in all. Of these, 135 affected the tongue or mouth,-the uterus and breast being alone attacked more frequently-122 were males, and 13 females. youngest case was 25 years old, and the oldest 78. Eighty-two per cent, of all the cases were found between 40 and 65 years. The average duration of life in twenty-nine cases which ran their course without operation was 18 4-10 months, from the time the

¹Read at the meeting of the Surgical Association in Boston, 'une 1, 18c2,

disease was first noticed,—the shortest time was 5 months, and the longest 53 months. In thirty-three cases in which the tongue was removed the average duration of life was 10 1-10 months, the longest 70 months. These figures coincide very nearly with those of Woelfler, who claims that statistics show a clear gain of six months of life in the cases operated on. In the thirty-three removals in which a fatal termination ensued the average duration of life after the operation was 8 0-10 months. the longest time was 30 3-10 months. It is to be remembered that these results represent the work of a number of different operators and a variety of methods. In the table of treatment the operations tabulated are excision with knife, excision with scissors, removal with wire ecraseur, and those destroyed by the actual cautery. A comparison with the work of recent individual operators will be made later. The situation in one hundred male cases was noted as follows:

Right edge, (middle 12, base 9),),		25
Left edge,	(mid	dle 9,	base	5),			18
Cheek,							10
Floor near	fræi	ium,					21
Dorsum,							4

Here again we find an agreement with Woelfler. The mode of origin is given as follows;

Sore, crack or ulcer, .						65
Hard lump or nodule,						18
Pimple,						5
Warty growth, .						3
White speck, .						3
Fungus outgrow	th fr	om	socket	t,		4
Boil and blister,						2

In 52 per cent. of all the cases there was a history of some previous injury or disease. 81 cases were assigned to injury; in 28—22 were due to irritation by bad teeth and 6 to other causes. 70 cases gave a history of disease of the tongue or mouth in 32, syphilitic lesions in 14, chronic superficial glossitis 3, icthyosis 14, and a wart in one case. In 29 out of 80 cases there was distinct evidence of syphilis. Only 6 out of 70 cases had never smoked, 41 had been great smokers, and 23 moderate smokers.

The evidence here presented of a precancerous stage in a large proportion of cases of carcinoma of the tongue is in entire accordance with the views of modern writers who, apparently without exception, enforce the frequency with which indifferent lesions may undergo cancerous degeneration. The frequency with which which syphilitic lesions of the tongue undergo a transformation into cancer has been emphasized by Fournier, Hutchinson, Butlin and others, and these lesions are now generally admitted to precede the cancerous growth in a large percentage of cases. The conditions which are commonly described as chronic glossitis. chronic superficial glossitis, psoriasis, leucoma and icthyosis, are now considered almost without exception to have an important etiological effect in the production of lingual cancer, and the above figures given from the Middlesex Reports are so fully borne out by general experience that the existence of a precancerous stage in a large proportion of lingual cancers may be considered as definitely established, and to the above may be added the irritation of bad teeth, the continued cauterization of sores, "spirit drinking, smoking and rough eating," the latter of which probably go a long way in explaining the greater frequency with which the male sex is affected. The family history shows that in 64 cases where the facts were known 50 of the fathers were dead, In 30 where the cause of death was known none were ascribed to any form of cancer, but o were due to consumption, or 30 per cent. Of the mothers there were two cases of cancer uterus and breast each one, and 2 due to consumption out of 29. In 75 families phthisis was found among the brothers and sisters in 20. The frequency of phthisis and infrequency of cancer in the families of those affected with cancer of the tongue is a noteworthy fact, and supports very strongly the view that lingual carcinoma is at first a local affection. In 34 cases of recurrence the average time after operation was five months, the shortest 2 weeks and the longest 52 months. 22 of the cases recurred in the cicatrix at the primary seat, and 10 in the adjacent glands. Above 30 of the 32 cases recurred within a year. The figures above given are in marked contrast with the experience of Hutchinson given in a recent lecture in which he states in justification of partial excision that in only four cases did recurrence take place within the month. The figures given in the Middlesex Report as to the condition of the lymphatic glands are of especial importance. In 94 primary cases there was an obvious enlargement in 78, or 83 per cent. In the remaining 16 there was no enlargement discovered. The following glands were affected:

Right side of neck (cl	28			
Both sides,				17
Left side (chiefly subm	axillar	y)		16
Sub-mental				5
Left and sub-mental .				3

Verneuil has pointed out that the lymphatics in three different localities may be affected and that these regions should always be examined in cancer of the tongue—the submaxillary -the supra-hyoid and the glands over the parotid sheath. Hutchinson says: "The gland affections may occur in any one of several regions. The commonest part is in the floor of the mouth. A second is under the anterior edge of the sternomastoid; where if it is single it is easily accessible, but not infrequently several glands surround and are adherent to the sheaths of the vessels. The worst position of all and not very infrequent, is behind the mastoid process and the upper part of the sterno-mastoid." In 52 autopsies on cases of cancer of the tongue the adjacent glands were involved in every case except one, and in 30 both sides were affected. It is generally admitted that metastatic deposits do not often occur. Woelfler asserts that where the growth is confined to the tongue itself the glands behind the angle of the jaw are most likely to become infected while if the floor of the mouth or sides of the cheek, the submaxillary glands. In these cases metastatic deposits were found seven times, both lungs and liver twice, both lungs twice, liver, mesentery glands, and left kidney each one. The causes of death in 51 cases not operated on are given as follows:

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The time and circumstance of the involvement of the adjacent glands demands more study. They may remain free for eight or nine months, or may become infected within two or three. The tendency to more radical operation is certainly more and more evident, and it may be that future progress is to be made in the line of treating the submaxillary space in cancer of the tongue, in the same thorough manner as is now generally done with the axilla in carcinoma of the breast. Satisfactory exploration of minute glands is as difficult in one region as in the other. Death sometimes occurs from hemorrhage, but is much more frequently due to exhaustion brought on by repeated small losses of blood, by the inability to swallow a sufficient amount of nourishment, and by the deleterious effect of foul discharges which constantly find their way into the stomach or lungs. A condition of septicæmia hastens if it does not directly determine death in a number of cases. It is not my purpose to discuss the diagnosis of cancer. Other forms of tumor occasionally occur but so seldom that they may be left out of account, especially as removal by the knife is the only efficient treatment. Mistakes of this kind are only likely to occur when the growth is within the substance of the tongue. In ulcerated epithelioma the diagnosis will most often hesitate between tubercular and syphilitic ulcer. The latter, we have seen, is often transformed into a true carcinoma. Mistakes are undoubtedly often made, and Butlin quotes Nedepil as saying that the four tuberculous ulcers he had met with had all been cut out under the mistaken idea that they were cancer, and the diagnosis only made after operation. Bull has recently reported a similar instructive case. Frequent accounts of tubercular ulcer of the tongue are now met with in current literature—the diagnosis being verified and based upon the demonstration of the bacillus tuberculosis and it is not impossible that mistaken removals have taken place much more frequently than is supposed. It is not impossible that some of the more brilliant cases where life has been prolonged for many years may have been tubercular and not cancerous. A diagnosis of a tubercular ulcer of the tongue ought to be made by the discovery of the bacillus. I have recently had the diagnosis of a doubtful case thus verified, the bacilli being found in large numbers in the scrapings. It is said, however, that this search is not always successful, even where the tubercular character of the lesion is undoubted. The mistake of a tubercular for a cancerous ulcer cannot, however, be considered a very serious one, for the complete removal of the former would here, as elsewhere, be the surest means of cure and the greater security against further infection. A less extensive operation, however, would probably be indicated in most tubercular cases. Syphilitic ulcers may occur as secondary or tertiary lesions—rarely a primary lesion. Difficulties of diagnosis are most likely to occur in cases of tertiary lesions. The presence of enlargements of the cervical glands is presumptive, though not positive evidence against the disease being syphilitic. Iodide of potash in sufficient doses will soon render the diagnosis clear, and should be energetically tried, but there is great uniformity in the advice given by most recent writers not to prolong the course if evident improvement does not occur in ten days or two weeks. Careful search for the bacillus and careful microscopic examination of a scraping of a sore for the characteristic cells of epithelioma should always be made, and if the examination is negative an anti-syphilitic course should be given. If this last is without effect after a reasonable time a free removal of the sore ought to be practised even in the absence of definite signs of cancer. Hutchinson recommends that the miscroscopic examination should be made after, and not before removal of the growth. Turning now to the treatment of cancer of the tongue the subject naturally divides itself into the operative or radical, and the palliative, indicated where the disease has passed beyond the range of surgical interference. Nothing short of complete removal can be considered as at all curative. Where the sore to be removed is limited in extent, whether distinctly cancerous or not, a large area of healthy tissue should always be taken away by a clean incision with scissors or knife; the removal of the entire tongue not being necessary in such The advisability of bringing the edges of the wound in these operations together by sutures is answered differently by different operators. Where the tip or edge in its vicinity is the seat of disease a wedge shape section reaching well behind the sore ought to be removed. These partial excisions seem to give as great immunity from return as the removal of the whole or half of the organ. The operations are much less severe and

the function of the tongue in swallowing and speaking is better preserved.

Before entering upon a discussion of the operative procedures for the removal of the half or whole of the tongue which have received the sanction of experience and are now most in vogue, it will be of interest to briefly outline a history of the operation through its various phases of development up to the present time. The progress of development has been marked by a tendency to more and more thorough removal of all disease, but at the same time to a restriction of complicated methods, and to the adoption of simple procedures. Throughout this development the fear of hemorrhage, and the apprehension of blood gaining access to the lungs at the time, or subsequent to the operation, have been conspicuous and controlling, features. The elaborate tables of Woelfler (Archiv. f. Klin. Chir. 81-82) have been the source from which subsequent writers have drawn their data for an historical review of the subject, and form the basis of both Barker's and Butlin's account. We may properly ignore the earlier operations dating back to Pimpernelle in 1658, and the early attempts to destroy the disease by strangulation and consequent sloughing of the tongue by means of ligatures, and the barbarous procedure of circumpuncture with rods of caustic introduced by Girouard; and may omit the futile attempts to control the growth by ligature of the linguals, and commence our sketch with the operations which form the basis of modern methods and are still more or less employed.

Infra-maxillary Operations.—Regnoli, in 1838, removed the tongue by an incision reaching from the chin to the hyoid bone. This incision was enlarged by lateral incisions next to the chin, and the floor of the mouth opened, and the tongue removed by scissors after being drawn through the opening in the neck, and after hemorrhage had been provided against by a number of ligatures. It is worthy of note that Regnoli's patient was seated in a chair with her head resting against the breast of an assistant—a position which closely resembles the one now recommended by some of the most recent operators. The sub-mental or supra-hyoid operation was modified by Billroth by omitting the longitudinal incision and extending the cut below the chin further back on either side so as to make it available for the

removal of the glands, and the ligation of the sub-lingual artery It was practised by this surgeon from 1871 to 1876, but given up on account of the great mortality-eight out of thirteen cases, or 61 3-10 per cent. During the same period his removals by the mouth showed a loss of 18 7-10 per cent. in thirty-two cases. A sub-mental opening into the floor of the mouth was utilized by Chassaignac, and has recently been strongly advocated by Barwell for the passage of the wire of the ecraseur. These methods are properly ecraseur operations and will be alluded to later. Kocher, in 1880, (Deut. Zeitschrift. f. Chir., 1880,) published the account of his operation by a sub-maxillary incision after a prelimary tracheotomy, and with a complete clearing out of the sub-maxillary space with ligation of the facial artery on the side affected, and both linguals, if necessary. The tongue was removed through the opening in the neck by scissors or galvano-cautery. This method in his hands was followed by a single death in fourteen cases. Numerous operators have used and modified the opening from the neck for the removal of the tongue, and it has many strong adherents as being the only means of effecting a thorough radical operation when the glands are involved, for, as Verneuil has pointed out, even if the implicated glands are removed by an incision over them after the excision of the tongue, the intervening tissue containing the lymphatic channels through which the disease has spread is left behind and must endanger a further infection. Kocher's method has received general approval though considered too serious an operation for general use, and does not seem to have been largely used by any operator except its originator. removal of the tongue by the ecraseur was first performed by Chassaignac in 1854, the wire being carried into the mouth by a puncture from the neck so as to embrace the better the base of the tongue. Its use has been strongly commended by a large number of eminent operators used either through an incision in the neck, or introduced by the mouth. Among those who have advocated its use and proclaimed its advantages may be mentioned Nunnely, ten cases and ten cures; Reid, four cases and four cures; Nottingham, Annandale, Kuester, Rose, Busch. Recently Barwell, has described a modified method of cutting through the base of the tongue by the wire introduced through an incision in the neck, and completing the removal by a second ecraseur introduced through the mouth. The great advantage claimed for the removal by the ecraseur is that it is secure against primary hemorrhage. The ecraseur has played an important role in the removal of the tongue and is still employed and strongly advocated by not a few of the more prominent surgeons. Among these may be mentioned Bryant and Hutchinson, the latter of whom has recorded his views in its favor in a recent lecture (Brit. Med., Dec., 1891). It has, however, decidedly lost ground in recent times, and some of the later writers condemn it in unmeasured terms. Treves says: "The instrument is barbarous and obsolete, and not in conformity with the principles of surgery. It represents the most slovenly and least efficient method of removing a part." While Whitehead asserts that "the wound left after the use of the ecraseur embodies every condition calculated to engender those putrefactive changes which it should be our primary aim to avoid—the erratic course of the ecraseur wire is absolutely beyond our control." The galvanic caustic loop introduced by Middledorf in 1854, and at one time largely employed by Bryant, seems to have been practically abandoned, and is condemned by Woelfler as "most often followed by hemorrhage and no protection against wound infection and recurrence." According to this author, Just, in nineteen cases, had hemorrhage in ten; Angier, in forty-five cases, found primary hemorrhage in five, and secondary in eight; and Schlaepfer met with hemorrhage nine times in thirty. In this now very general disapproval of the use of the ecraseur wire an exception may possibly be made in favor of the method introduced by Morant Baker (Brit. Med. Jour. 2-765, 1883,) in which the tongue is split along the median line after being fully freed by scissors from the floor of the mouth, and then removed in halves.

Division of the lower jaw was first practised by Roux, 1836 (Butlin), subsequently by Sedillot and Syme. The operations of this latter surgeon have had a marked effect upon the surgery of the tongue among English speaking surgeons. Billroth modified the division of the jaw by practising a temporary resection of the body of the bone which was subsequently replaced and wired, but later this surgeon admitted the superiority of Langenbeck's

method of division of the bone and soft parts opposite the first molar. The experience of Billroth, however, is not favorable to the division of the jaw in removal of the tongue. In 12 cases he had 3 deaths, 3 recurrences, and one case free for two years after operation. The remaining five could not be traced. In the list of cases of excision and resection collected by Woelfler from various operators the same unfortunate result is to be seen. In 49 cases there were 17 deaths, or 34 per cent., and 14 recurrences of the disease. Anger has collected 20 cases of section of the jaw with 10 deaths. The conclusion which Woelfler reached was that section of the jaw in the removal of the tongue involves great danger, much discomfort and no better results as far as a radical operation is concerned. The advantages of section of the jaw have been recently again strongly advocated by F. Krause (Deut. Med. Woc., May 30, 1890), where there is extensive disease of the tongue and mouth, based upon the statistics of Volkmann's Clinic, and it must be confessed his figures are most striking and fully justify his conclusions. In 35 operations there was one death from lobular pneumonia and one from causes not connected with the operation.

Division of the cheek in order to obtain freer access to the organ, was introduced to the English speaking surgeons by Collis in 1867, after first being practiced by Jaeger in 1831. It has received the approval of Butlin on diseases of the tongue, and has been commended by Fourneaux, Gant, Wagstaffe, and Rose. Jacobson considers "this step an excellent one," and Treves also seems to approve of it. Woelfler, however, says that it is unnecessary and far inferior to Kocher's method. Volkmann also condemns it. It must add to the discomfort, it certainly is permanently disfiguring, and in no way facilitates the removal of glands, and it would seem can be of advantage only in the limited number of cases where the disease is confined to the tongue situated far back, or when the jaws can not be sufficiently widely opened.

The advisability of the preliminary ligature of the lingual artery is still under discussion. Introduced by Mirault in 1833, it has been extensively practised and strongly advocated by Billroth, and recently by Treves in his work on Operative Surgery. The former surgeon considers that it is to be commended as a

rule. In 63 cases, in only I was there hemorrhage, and "as a rule, when both arteries are ligated, the muscles appear as bloodless as when an Esmarch bandage is applied to a limb." In Treves' experience of 34 ligations of linguals there was no hemorrhage. Jacobson and Whitehead both deny that it is reliable as a safeguard against hemorrhage, and to this Krause also agrees. In a personal case where the sublingual artery was ligated on account of a hemorrhage from a wound in the tongue, by a knife which had pierced the cheek, the hemorrhage recurred in 48 hours, and required a ligature of the external carotid. Hutchinson condemns it as unnecessary and as adding a complicated and difficult step to the operation. In this latter view I am inclined to think the majority of surgeons will agree.

Preliminary laryngotomy was advocated by Kocher in connection with his operation on the ground that it allowed of complete plugging of the pharynx during the operation, and so avoided the escape of blood into the trachea, and by breathing through the tube during the first few days the great danger of septic-pneumonia was avoided. This step has been highly commended by Jacobson, but it is generally condemned as adding an additional element of danger. It is wise, however, always to be prepared for tracheotomy in case it should become suddenly necessary. In removal of the tongue for limited disease, Pean uses hæmastatic forceps. One pair grasps the tongue transversely behind the growth. A second is applied in the median line, and a third grasps the tissues in the floor of the mouth. Spurting arteries are grasped by forceps, and a ligature applied, or the forceps left in place for 24 hours. This method meets the approval of Duplay in his recent surgery, but has not apparently been further adopted.

Finally, the simplest of all the procedures, the removal of the tongue through the mouth by means of scissors, was introduced by Whitehead, and has been steadily gaining favor ever since until it seems likely to supplant all other operations, either in the form suggested by the author, or some of the slight modifications advocated by other operators.

Removal of the tongue by scissors after ligature of the linguals was adopted by Billroth independently at about the same time, after this surgeon had tried the instrumental incision, division and resection of the jaw, and splitting of the cheek, and his later operations have apparently been made by this method.

In this sketch of the operative methods for the removal of the tongue we may mention the suggestion of Heath to control hemorrhage by hooking the finger behind the base of the tongue. or stump, and drawing it forcibly forward; and the further suggestion of Treves for the same purpose of pressing forcibly with the fingers in the neck so as to make the floor of the mouth more prominent and bring the spurting arteries readily within reach. Jacobson has shown that the extraction of the incisors of the lower jaw facilitates all forms of operation through the mouth by enabling the operator to reach more easily the frenum and floor of the mouth. The attempt to cover the surface of the wound in the mouth by bringing together the mucous membrane over it was at one time practised by Billroth, but given up as causing great pain and swelling and increasing the distressing flow of saliva. It is now strongly advised by Pean, Duplay and Volkman but does not seem to be generally adopted.

It remains now to describe more minutely the steps of the various procedures which at the present time are prominent candidates for professional favor, and to describe the results which have been obtained. Before, however, giving the details of the different methods we may adopt the propositions laid down by Treves as fully justified by the preceding discussion.

First. The organ should be removed by cutting either with scissors or knife.

Second. The removal should as a general rule be effected through the mouth.

Third. Every means should be taken to reduce the hemorrhage to a minimum.

Fourth. When the floor of the mouth is involved, or the glands extensively involved, the excision should be carried out through the neck.

The methods we shall describe are Whitehead's, Morant Baker's, Kocher's and Volkmann's.

The following account of Whitehead's operation is obtained from the British *Medical Journal*, May 2, 1892, in which his entire experience is embodied up to that day. A few days of

preparatory treatment is urged as judicious for the "purpose of generous feeding and more especially to obtain a cleanly condition of the mouth." Chloroform is used though no objection to ether is known. "The gag which secures the wide opening of the mouth must avoid pressing back the jaw so as to impede respiration. The patient is in a sitting posture with the head firmly erect with a slight inclination forward, in such a position that the light will fall well into the mouth."

To prevent the tendency of the patient to slip down "he should recline against an almost perpendicular back rest with the thighs bent at almost a right angle over the elevated portion of the operating table." A ligature is passed through the anterior part of the tongue and straight blunt pointed scissors are used for the section. "The two structures which are principally responsible for the retention of the tongue within the mouth are the frænum, and the anterior pillars of the fauces, and if these structures are completely divided the tongue can be so freely drawn from the mouth that the operation is converted into an extraoral incision. The tongue is rapidly separated by cutting through these structures and the floor of the mouth," and instead of the cautious snipping originally advocated the author "now cuts boldly until within the immediate vicinity of the main artery disregarding all bleeding unless an artery distinctly spurts when it is twisted." "The more profuse the general bleeding," he says, "the more rapidly do I proceed, my object being to get as quickly as possible at the main artery as I have confidence that all subsidiary bleeding will cease immediately after their division. There is in reality no difficulty in determining the position of the lingual arteries as they are invariably found in the same situation and it requires very little experience to seize them with a pair of forceps before dividing them. If this is done there need not be the slightest hæmorrhage from this source. "When once the vessels are twisted the rest of the tongue may be removed without any further anxiety about hæmorrhage; but it is desirable before severing the last attachment to pass a loop of silk through the glosso epiglottidian fold as a provisional measure of security in case it may become necessary to make traction on the posterior floor of the mouth either to assist respiration or to arrest any possible consecutive hemorrhage." This thread is a source.

of annoyance and is withdrawn within twenty-four hours, and has really only been of practical use in two cases. The cut surface is then rendered as aseptic as possible by swabbing the parts with a biniodide of mercury solution one part to one thousand and painted over with an iodoform styptic solution—friar's balsam—in which the spirits are substituted by a concentrated solution of iodoform in ether, one part in ten of turpentine having been added to the ether. This varnish is repeated daily. The patients are not confined to the bed but encouraged to walk out the day after the operation if there is sunshine and there is no "worse practice than keeping patients lying flat on their backs in bed." The average time of convalescence is seven days.

The scissors are preferred to the ecraseur "because they leave a clean cut surface instead of a bruised one, and further because with much greater certainty all diseased tissue may be removed." Whitehead has recently published the result of his entire experience in the removal of the tongue in part or in whole, one hundred and thirty-nine times. In the table given below 10 successful cases of removal by the galvano-cautery and 25 partial removals by scissors are excluded, and there remain 104 cases of removal by the method above described, with 20 deaths, or 19 21–100 per cent., or calculated upon the whole number, 14 3–10 per cent. When glands and jaw were involved, 77 per cent. and 57 per cent. respectively.

One hundred and four cases of excision of the entire tongue with scissors gave 84 recoveries and 20 deaths.

Excision through the mouth—79 cases.

Simply and uncomplicated—66 cases; 63 recoveries and 3 deaths.

With removal of floor of mouth, tonsils and glands—13 cases; 9 recoveries and 4 deaths.

Preceded by laryngotomy and tracheotomy—9 cases; 7 recoveries, 2 deaths.

Excision below the jaw—9 cases; 2 recoveries and 7 deaths.

Division of jaw or removal of portion of jaw—7 cases; 3 recoveries and 4 deaths.

These figures at once strike us as presenting most favorable results in the simple removal of the tongue, and an unusual mortality in the limited number in which the removal was effected from the neck or by division of the jaw. These latter cases probably belong to the more desperate ones.

The results are stated to be that in 61 cases where positive evidence was obtained, 15 patients survived the operation one year; 4, two years; 2, three years; 4, five years, and one, six years. Twenty-six cases, therefore, were living more than a year after the operation. This is the best result yet published by any authority.

On the value of Whitehead's operation Treves says: "There can be no question," but advises the preliminary ligature of the linguals as facilitating the removal by preventing all hemorrhage, and recommends either Coleman's or Mason's gag.

Jacobson, who believes that it is of great advantage to leave half of the tongue where possible, commences the Whitehead operation by splitting that organ down the raphé with a sharp-pointed bistoury and further urges the advantages of preliminary tracheotomy, but condemns the ligature of the sub-lingual arteries. Mr. Treves reports in 34 cases of entire removal of the tongue with scissors and preliminary ligature of both lingual arteries, that he has had one death from pneumonia, one from pyæmia, and a third patient with aortic and mitral disease, died shortly after the operation.

The only ecraseur operation which I shall describe is the one suggested by Morant Baker, and the account is taken from Heath's Dictionary. "After the introduction of a suitable gag, and the removal of any sharp or jagged teeth which might be in the way of the operator, two threads are passed through the tongue about an inch behind the tip, and half an inch from the median line. The tongue now being drawn upward and forward the frænum and as far as may seem necessary, some of the muscular attachments of the tongue to the lower jaw in front are now snipped through, as advised by Sir James Paget, with strong, blunt-pointed scissors, and the scissors are then run along the floor of the mouth at the side beneath the mucous membrane as far back as may seem requisite, keeping close to the lower jaw both for the avoidance of hemorrhage and for the sake of keeping clear of the disease. The operator now with his forefinger clears the tongue in front and at the side, and drawing it well forward again and giving, one thread to his assistant, while

he holds the other himself he cuts along the middle line of the tongue from the tip backwards and further along the mucous membrane. On withdrawing the knife the finger is again introduced and it will be found quite easy to complete with it the median division of the tongue by a little tearing or splitting into two halves.

The only part which cannot be thus torn is the mucous membrane of the dorsum. Hence the advice to divide this with the knife as far as may seem necessary for getting beyond the level of the disease. The ecraseur is now slipped over the diseased half of the tongue. This of course is the most important part of the operation. Any want of care in this stage being shown by the narrow margin of healthy tissue, or by none at all, left attached to the diseased mass. The insertion of one or two curved needles well behind the disease before the application of the ecraseur in order to insure the division in healthy tissue is advisible, but for the reasons previously given must not be considered a sufficient safeguard in absence of free separation of the tongue's attachments in front and at the sides. When one-half of the tongue is removed the process is repeated on the other. "An ecraseur curved on the flat armed with strong whip cord is used. Where there is difficulty in placing the cord behind the disease the cheek may be split with advantage. Commonly the main vessels and some other tissue, perhaps nerve fibres, are pulled through the end of the ecraseur after the softer tissues of the tongue have been cut." These may be secured by double ligture and then cut. After this glands should be searched for and removed, either from the floor of the mouth or by an external incision. If hæmorrhage should occur Heath's method of controlling it has been found serviceable.

In the after treatment iodoform in powder is applied to the cut surface and removed when the wound becomes foul, small pieces of ice are kept in the mouth and mouth washes constantly used, and in almost all cases the patient is fed with a tube and funnel. When necessary, nutritive enemata are resorted to. Baker reports 40 cases with 5 deaths.

In the above operation the ecraseur is only used to cut through the tissue of the tongue after this organ has been fully freed by scissors from the floor of the mouth. There are several steps in the method advocated by Baker which have proved important additions to the operative technique of removal of the tongue. When the tongue is to be split into lateral halves he has shown the advantage of two threads passed through the organ behind the tip, one on either side of the median line, over the single thread generally used.

His method of splitting the tongue by cutting through the mucous membrane as far back as necessary on the dorsum and then tearing through the raphé avoids all hemorrhage and is a great improvement over division by the scissors or knife.

No statistics based on a large number of cases operated on by Baker's method have been published, but it seems to have been largely practised and to have met with general approval.

Kocher's operation has received the commendation of most of the later writers for cases in which the floor of the mouth and sub-maxillary and cervical glands are involved, though it apparently has not been largely practised as being too serious an operation in cases in which the growth is confined to the tongue. Kocher commences his operation by a tracheotomy, and "fills the fauces with a sponge wrung out of carbolic acid and secured by a string." The description of the operation is taken from Butlin. "The first incision is made along the anterior border of the sterno-cleido mastoid muscle commencing a little below the tip of the ear. From the first a second incision is made from the middle of the sterno-mastoid muscle to the hyoid bone and along the anterior border of the digastric to the jaw. The flap is turned up on the cheek and the facial artery and vein and the lingual artery are tied. The sub-maxillary fossa is then completely cleared out, commencing from behind; the lymphatic glands are all removed, and even the sub-maxillary and sub-lingual glands, if the disease lies so near as to affect them. The mucous membrane is now divided along the lower jaw and as much as is necessary of the mylo-hyoid muscle is separated from the bone, the tongue is drawn down through the opening, is exposed with great ease and is removed either in part or in whole with scissors or the galvano-cautery. The galvano cautery is preferred by Kocher on account of the less liability of oozing after it has been employed. If the whole tongue is removed the lingual artery of the opposite side must

be ligatured through a separate incision. "If the operation is great the external wound is not to be closed with suture." The tracheotomy canula is left in and allowed to lie loose in the trachea as usual after tracheotomy. In order that the wound shall not in the slightest measure be infiltrated by the discharges the skin-flaps are fixed back with sutures and the entire cavity from the entrance of the wound right back into the mouth and pharynx is plugged with a tampon of gauze soaked in a solution of carbolic acid of 5 per cent., but before so strong a solution of carbolic acid is applied directly to the mucous membrane of the mouth the tampon is just washed over with water. The sponge or gauze lies immediately on the epiglottis or root of the tongue, and fills the bottom of the wound as far as it is covered with mucous membrane. The whole operation is done under the carbolic spray, the patient may be fed partly by the rectum, but feeding is accomplished chiefly when the dressings are changed. "This is done twice a day under the spray and before a fresh dressing is applied. Nourishment is given through a tube introduced into the stomach." In fourteen cases thus operated on there was only one death. Kocher's operation is indicated when the floor of the mouth is extensively involved or where the glands beneath the jaw are enlarged. It not only enables the surgeon to fully clear out the sub-maxillary space but secures the removal of all the tissues which lie between the primary seat of disease and the infected glands, the importance of which as a source of future danger has been pointed out by Verneuil. At the present day the spray must be regarded as superfluous, and the preliminary tracheotomy is probably unnecessary.

The extraordinary success which has followed Volkmann's method of operation as recently reported by Krause renders it desirable to describe the special procedure which has been adopted by this surgeon. In 91 cases of tongue cancer which were operated on there were only two deaths directly attributable to the operation. Tracheotomy and tamponade are discarded and splitting of the cheek considered useless. The following account of the two methods adopted is taken from the Annual 1890, "If the tongue can be drawn beyond the dental arch a resection is made by means of a knife or scissors, while the patient is seated upright

in a chair so that the blood flows away from the pharynx and there is no danger of its being drawn into the lungs. After bleeding is checked the mucous membrane can at once be brought together, or if there is a long strip of healthy tongue left this can be brought around so that a short but broad organ is left. If, however, the carcinoma extends so far posteriorily that strong traction is not sufficient to bring it near the dental arch, or if it has involved the floor of the mouth or tonsils, then the parts can be best exposed by dividing laterally the submaxillary bone. The patient is upon a table in an almost sitting posture, a traction thread is passed through the tongue and the latter is drawn forcibly forward. The lower canine or first molar tooth is then drawn, after which an incision is carried directly downward from the corner of the mouth to the larynx dividing the periosteum of the lower jaw, but made more superficial in the neck. The periosteum on the lower surface of the lower jaw is now pushed aside sufficiently to allow a broad iron lever to be passed upward until it rests upon and protects the upper lip. The jaw is divided upon this lever by a thin broad-bladed amputation saw, cutting obliquely backward, a strong resection hook is placed in each opening of the exposed intra-maxillary canal, the two portions of bone are drawn forcibly apart and the soft parts of the mouth are divided on a line of the first incision. Sufficient room is given for readily securing all bleeding vessels. The palato-glossal fold is divided and a drainage tube the size of the little finger placed in the tonsillar fossa and curved to the lower portion of the neck incision." Thirty-five cases gave one death due to pneumonia. "The cut surfaces are covered by mucous membrane and the bone wired. The patient retains a half reclining posture and is fed on liquid diet by means of a long glass tube extending far back into the mouth, which is irrigated after each meal with a three per cent. boracic acid solution. One case was living after six years—the average of life was about one year. Of thirtyseven partial excisions three have survived without relapse for over three years. Any attempt at tabulating and comparing the results obtained by different operators must be evidently unsatisfactory and unreliable. The cases differ so much in severity and in the immediate danger, and operators still differ so much in their views of the necessary extent of the operation indicated, that a standard of comparison is impossible. Between the partial excisions of Hutchinson and the case reported by Whitehead in which the entire sterno-mastoid muscle and jugular vein were removed and the whole extent of the carotid laid bare in order to fully remove all the glands involved there is so much dissimilarity that the results cannot be judged together. Mr. Treves' estimate that the immediate mortality is now about ten per cent. may be considered as nearly correct and shows a marked improvement in the recent operations over earlier experience. There is evidence to show that the operation of removal by scissors is growing more and more popular while the ecraseur is certainly losing ground. Mr. Butlin writing in 1885 gives his preference for Baker's method because he had not seen Whitehead's operation often performed. During the last five years St. Bartholomew's Hospital reports (Mr. Butlin's Hospital) show that the whole tongue has been removed by scissors six times, and the lateral half by the same method twenty-one times during the last five years. During the same time the ecraseur was used in seven cases for removal of half of the tongue, and seven times for removal of the whole. In 1891 the ecraseur is reported as being used only only once in ten cases. In a table of fatal cases of removal of the tongue a very large proportion will be found due to septic pneumonia, induced undoubtedly by the escape of blood into the trachea at the time of operation, or from some of the subsequent discharges from the wound in the mouth reaching the lungs. Cellulitis of the neck, collapse and hemorrhage, pyæmia and septicænia are all causes of death. The great frequency with which the lungs become involved has induced different operators to avoid all possible loss of blood at the time of operation-indeed, hemorrhage in these cases is serious not from its amount but because it obscures the field of work and from the danger of blood reaching the trachea. The history of the operation is a history of efforts to avoid these dangers and in the after treatment to avoid the danger of foul and decomposed discharges developing in the mouth. The three great factors in the after treatment are summed up by Treves as follows:

First. -Let the patient be well fed.

Second.—Let all discharges escape from the mouth.

Third. -Keep the cavity of the mouth clean and sweet.

The first of these is now generally admitted, and if the patient can swallow sufficient food the mouth is the best channel, a tube being only exceptionally needed for the first few days,—if necessary, nutrient enemata may be employed. The second of these conditions is met differently by different operators. The great advantage of the sitting or half-raised posture is now largely recognized, and the very great disadvantage of continued recumbency after the operation enforced. Whitehead encourages the patient to get up on the second day and Treves approves of the same plan. Some operators depend largely upon a drainage tube whether the mouth has been opened from the neck or not. In order to keep the mouth clean and sweet the most various plans and greatest variety of washes have been adopted. Some depend upon frequent syringing, while others prefer constant gargling. Permanganate of potash, carbolic acid, sublimate solution, boracic acid and spirits and water have all been used and strongly commended. Billroth attempts to prevent contamination by the careful packing with iodoform gauze. This method does not seem to have found favor with English surgeons. Butlin lost a patient with septic pneumonia and Whitehead is reported by Treves to have had the dressing swallowed in one case. A very large proportion of operators, however, rely largely upon iodoform frequently dusted upon the wound. In this connection the styptic iodoform solution of Whitehead should be mentioned. The important thing seems to be the frequent removal of the discharges from the mouth and for this purpose there is great advantage in having the patient up and out of bed. There remains to be considered the best palliative treatment where operation is not indicated, or where the patient refuse surgical interference. Pain is the first symptom to be considered It is generally present in a marked degree. Butlin approves of the application of a powder of iodoform, one grain, morphine one-six to one-half grain, and borax, three grains, applied directly to the painful spot. A number of authors mention the same application, but apparently without personal experience. The powder is to be reapplied at short intervals. Cocaine has naturally come into use either by application to the surface of the sore, or by injection around the border of the ulcer by a hypodermic syringe. The danger of establishing the cocaine habit

must not be overlooked. One such case has come under my own observation. A lady for a painful ulcer under the right side of the tongue began the use of cocaine, and when seen was using 30 grains a day injecting a solution of the drug by means of a hypodermic syringe into the borders of the ulcer. The habit was confirmed and her condition distressing. The effect upon the local sore was no less disastrous; an enormous ulcer surrounded by walls of sloughing tissue had undermined two-thirds of the tongue whose movement was so impaired that swallowing was difficult. A dangerous amount of cedema of the glottis existed. The patient was under observation a short time and the character of the disease could not be definitely determined. Whitehead has offered his protest against the insufficient doses of morphine often given, and gives the details of a case where the amount finally reached 30 grains a day with evident comfort and with no disturbance of the mental power. Since the first performance of section of the lingual nerve by Hilton it has been constantly recommended by different writers for the relief of severe pain in the tongue, either from neuralgia or cancer. Stretching of the same nerve was first suggested by Le Dentu. In a case of recurrent cancer in which the anterior half of the right side of the tongue had been removed I exposed the lingual nerve and stretched it until it broke. Relief of pain at first was. complete but lasted only about two weeks and was then as bad as The operation is easy of performance and a section of the nerve should certainly be removed where the pain is severe, relief for even a few weeks is well purchased at the cost of so simple an operation. Section of the nerve is likely to prove most efficient when the growth is situated well forward on the side of the tongue. Extreme and distressing salivation is said to be at once controlled by a section of the lingual nerve.

For the relief of salivation and fetor various mouth washes have been advocated—iodoform, salicylic acid, and the vapor of creosote have met with most favor. In the majority of cases of cancer of the tongue a sufficient amount of liquid nourishment can be taken without much discomfort, but in some cases where the least movement is most painful it is found impossible to administer the necessary food. In such cases great and sometimes complete alleviation of the suffering in swallowing can be ob-

tained by freely painting the sore and fauces with cocaine just before the administration of food, or a soft rubber tube may be passed into the œsophagus—a simple manœuvre that the patient can easily learn to accomplish. The food should be of the blandest character and free from pepper and spice and should be in the form of minced meats and jellies or fluid.

The following conclusion I consider justified by the foregoing discussion:

First.—Sufficient experience has been accumulated to show that the removal of cancer of the tongue prolongs life and adds to the comfort of the patient and further affords a reasonable hope of a permanent cure.

Second.—All operations should be preceded by an effort to secure thorough disinfection of the mouth and teeth.

Third.—In the treatment of continued ulcers and sores on the tongue caustics are to be avoided and all sources of irritation removed.

Fourth.—Persistent sores on the tongue should be freely removed by knife or scissors if they resist treatment.

Fifth.—When the disease is confined to the tongue White-head's operation should be employed for its removal.

Sixth.—In this operation the advantage of preliminary ligature of the lingual artery is not definitely settled but the weight of authority is against its necessity.

Seventh.—The advantage of leaving one-half the tongue in unilateral disease must be considered undetermined, but the weight of positive experience is in its favor. In splitting the tongue into lateral halves Baker's method of tearing through the raphé should always be employed.

Eighth.—A preliminary tracheotomy adds an unnecessary element of danger in the removal of the tongue in ordinary cases.

Ninth.—When the floor of the mouth has become involved or the glands are enlarged Kocher's operation should be performed, omitting the spray and preliminary tracheotomy.

Tenth.—Removal of the glands by a separate incision after the removal of the tongue must be considered insufficient.

Eleventh.—Volkmann's method still rests on individual experience. Its just value cannot be determined until it has been subjected to trial by a number of surgeons.

Twelfth.—Thorough and complete removal should be the aim of all operation, whether for limited or extensive diseases.

Thirteenth.—By whatever method the tongue is removed the patient should be up and out of bed at the earliest possible moment, and should be generously fed.

CASES OF OPERATION IN SPINA BIFIDA AND ENCEPHALOCELE, WITH REMARKS.

By A. T. CABOT, A. M., M. D.,

OF BOSTON.

At our last meeting Dr. J. W. White, in his able paper on the Surgery of the Spine, speaking of the operative treatment of spina bifida, presented the conclusion arrived at by the Committee of the Clinical Society of London, as that held by most surgeons of the present day. This is: "That while various successes have been reported by other methods such as simple tapping and drainage, and more recently in a limited number of cases by excision of the sac, yet on the whole the method of injection of the sac offers the best prospect of ultimate recovery with the least immediate danger."

This is an opinion unquestionably justified by the facts as they stand at present.

The operative treatment of spina bifida and encephalocele by incision has always been viewed with great disfavor. Treves says of spina bifida: "These operations can only be undertaken in those comparatively infrequent cases where the sac is quite free from either the cord or any of the spinal nerves." And again: "The modus operandi is of little moment. If the sac contains cord elements, the result will prove fatal."

In encephalocele he says that an operation is only to be considered when rupture of the sac is imminent, and then he recommends tapping with the subsequent application of pressure.

It is to be remembered, however, that constant improvement is being made in the results of operation on the nervous system. And many of the facts upon which these opinions were based were collected at a time when asepsis was not so generally obtained in operative work as at present.

It seems to me, therefore, important to accumulate as much recent experience as possible upon which to form our modern

views of this subject, and it is as a contribution in this direction that I make a report of the few cases I have had.

CASES OF SPINA BIFIDA.

Case I.—Lillian F., aged nineteen months, was brought to the Massachusetts General Hospital on July 9, 1886. She had a tumor over the sacro-lumbar region of the spine, which was about double the size of the child's fist. The tumor was elastic, fluctuating, translucent, with a tendency to be pedunculated, the pedicle being about two inches wide. No perceptible change occurred in the tumor when the child cried. The skin covering the tumor was normal in character around the base, somewhat thinned as the summit was approached, and on the top was a small ulcerating surface.

The legs were paralyzed, and in a somewhat spastic condition, it being difficult to separate them; and the child seemed to have no control over her water. With this exception, she seemed in every way normal.

The history was, that at birth the tumor was about the size of a hen's egg, but that after three months it began to grow, and at the time of entrance was double the original size. The fact that the tumor was still increasing in size and beginning to show a tendency to ulcerate on the surface, together with the evidence that communication with the spine was certainly not free, made an operation seem advisable.

This was accordingly done on July 12th, 1886. With the object of preventing any unnecessary loss of cerebro-spinal fluid, a Spencer-Wells clamp was applied to the pedicle and gradually tightened as the fluid was allowed to flow out of the cyst. Skin flaps were then dissected up, and the tumor was cut off close down to the spine. The stump made by the division of the cyst was sewed across to and frowith catgut, and the skin was then brought together over it with silk sutures, the clamp being taken off as soon as the wound was tightly closed. The opening into the bony canal in this case was small and could be made out with difficulty; it was certainly not larger than the tip of the little finger.

The child recovered well from the ether, although it was rather restless for a day or two. On the second day the bandages were stained with serum, and on opening the dressing it was found that this serous fluid oozed from some of the stitch holes. The wound healed well by first intention, but this leakage of serous fluid continued for more than a fortnight. It then ceased, however, and when the child was seen, more than a month later, everything was closed.

The sac of the tumor was much trabeculated, and divided into separate chambers. It being summer and difficult to get pathological work done, no proper examination was made of it. I am, therefore, unable to say whether it contained nerve elements or not. An examination was made of the fluid that flowed away after the operation, and its character was found to be that of cerebro-spinal fluid.

This case was heard from in May, 1892. The back had remained entirely well since the operation, but the child had gained no power in the legs, and had not gained any control over the urine.

Case II.—Cora W., aged four years, was seen November 26, 1887. She was a well-nourished child, fully developed except that the legs were almost wholly paralyzed, a very slight amount of motion being preserved in the right one. She had never used them, being unable even to creep. She had full power over the bladder and the rectum. Her head was somewhat large, with a bulging forehead, rather narrow, laterally. The child appeared stupid, but her parents declared her to be bright and intelligent.

Over the lumbo-sacral region was a tumor, 13½ inches in circumference at the base. As it was somewhat pedunculated, its circumference nearer the top was 14½ inches. It was tense, translucent to transmitted light, and with a strong light no solid portion could be made out. It was covered with true skin, but this was very thin over the apex, and was there adherent to the wall of the cyst below. Nearer the base the skin was thicker, and not attached to the cyst. The surface was congested, almost ulcerating, with a serous exudation. The tumor was not tender and gave no pain upon handling. Laughing and coughing did not increase its tension.

The child was brought from Kansas, where her home was on the prairie at a distance from any medical advice, and as the tumor was growing and beginning to show a tendency to ulcerate on the surface, the parents desired that something should be done which would remove the danger of rupture, and clearly understanding the danger of the operation, they wished that the removal of the sac should be attempted. This was accordingly done on December 5, 1887.

A special clamp was made to compress the pedicle of the tumor during the operation and thus prevent the escape of cerebro-spinal fluid. It worked satisfactorily, and no fluid was lost during the operation. It was impossible, however, to entirely remove the sac, a considerable portion of its wall being left close against the spine. The thinner portions of its wall were, however, entirely cut away, down

to where the skin was thick and of a normal character. The sac was multilocular; the fluid contained was clear and estimated at two pints. The edges of the sac were sewed with catgut, and the skin was brought together with silk.

The recovery from ether was satisfactory, with very little vomiting. The child took milk as soon as she was able to swallow, and suffered but little pain.

The second day there was some accumulation of fluid in that por tion of the sac that was left, and a slight amount of leakage from the lower part of the wound. The temperature, immediately after the operation, reached 100.8° F., but the following morning it had fallen to 100° F., and the fourth day it came down to 99.4° F., being 98.6° F. that evening. Up to this time the child seemed to be doing well in every respect, except that the escape of fluid still continued.

On the morning of the fifth day the temperature was 98° F., the condition of the child seemed good, and she was taking nourishment well. Towards evening, however, she became quite restless, and did not care for her milk and presently the hands and feet became cold. Towards midnight it was noticed that the muscles of the neck and back had become very rigid, and this condition continued without active convulsions. On the morning of the sixth day, with the gradual failure of strength, the pulse and temperature rose, the latter reaching 101.6° F. The child died that morning. No autopsy was allowed.

The examination of what was removed in this case showed the presence of considerable nerve trunks on the walls of the sac.

These two cases are the only ones in which I have operated for spina bifida, and the results are certainly not favorable to the operation. In the first, encouraged by the evidence that the communication with the spinal canal was small, the operation was done with a strong hope of success, and the result justified this expectation, as far at least, as the survival of the child went. It is to be regretted that no careful histological examination of the tumor was made. Follin and Duplay found nerve elements present in five-sixths of all cases, and the paralysis of the child, which has become more manifest as it has grown up, makes it probable that the spinal cord or its nerves were more implicated in this tumor than was at first supposed.

In the second case we had a very different condition. The sac was large, threatened rupture, and freely communicated with

the spinal canal. A rupture at a distance from medical aid would almost certainly cause speedy death. There was little doubt that the cauda equina entered the sac. The persistence of paralysis for four years did not encourage the hope of any considerable restoration of function. The case belonged to that class in which operation has most commonly failed.

At the same time, the child was in good general condition. The nerves included in the sac did not preside over any vital function, and there was sufficient sound skin around the base of the tumor to cover the defect after all the thinner portion of the cyst that threatened ulceration had been removed. It seemed possible, therefore, that if the operation was made perfectly aseptic, it might be successful. Without an autopsy it is hard to satisfactorily explain the fatal issue.

In these cases especial care was taken to prevent the loss of cerebro-spinal fluid during the operation. Later experience of operations in the spinal cord seems to show that this is a needless precaution, as the fluid escaping during such an operation does not appear to affect the nervous centres injuriously. In answer to a question, Mr. Horsley writes me that he regards the loss of cerebro-spinal fluid during operation a matter of no importance whatever.

On the other hand, I think it important to close the wound after operating so closely that leakage of the spinal fluid shall not continue. For, first, it seems not improbable that a continuous and considerable loss of this fluid may seriously alter the internal pressure in the cord and brain; and secondly, the constant wetting of the dressings makes it extremely difficult to keep them thoroughly aseptic, and if the area about the wound once becomes infected, the extension of the inflammation inwards may be very rapid.

In my second case there may have been extending inflammation of the cord, but in the absence of outward signs of inflammation about the wound, and with no characteristic signs of spinal irritation, it seems more probable that the constant drain of the cerebro-spinal fluid injuriously affected the internal pressure in the cord and brain. I should certainly in another case take even more pains to tightly close the wound against the possibility of leakage.

The plan of operation in both of these cases was rude, and was largely dominated by the fear of an imaginary danger from the immediate loss of cerebro-spinal fluid. With this fear laid aside, the operation planned by Bayer should be carried out, if the case permits.

He makes an opening in the side of the sac, in order to avoid injury of the nerves. He then cuts off those nerves that end in the wall of the sac, and freeing those that run through the sac, replaces them within the spinal canal when possible. If the opening is small enough he closes it by ligature, for which he uses catgut. Fearing inflammatory extension through secondary fistulæ, he closes any point of leakage as soon as possible after it appears.

He has operated thus upon five cases, of which three were successful.

Case III. Encephalocele. Operation. Recovery.-Mary Ann H., a child of eight months, was brought to the Massachusetts General Hospital on June 11, 1891, and entered under the care of Dr. John Homans. On the first of July, at the change of service, I took charge of her. She had a tumor on the back of the head, which had existed since birth, being at that time small and having gradually grown until, at the time of entrance, it was about the size of a small orange, decidedly pedunculated. It was everywhere covered with normal skin, but this was very thin over the upper part of it. The child had never had any symptoms of cerebral trouble, and there was only a very slight tenderness over the tumor. Pressure could not diminish the size of the tumor, which was translucent and fluctuating, but did not pulsate. Examination under a high light did not show any especially solid portion in the pedicle. The opening in the skull was made out to be about large enough to admit the tip of the forefinger.

During the month of June this cystic tumor was injected three times with Morton's solution of iodine, each time being previously emptied through a trocar. The fluid that was drawn off was clear, slightly yellow and albuminous. After each treatment the tumos rapidly refilled and quickly reached its former size. These injections were repeated three time in July, but all without the least effect in diminishing its size or bringing about any hardening. On August 5th, as no gain had been made by treatment, it was decided to operate.

The condition being evidently, in part at least, a hernia of the membranes of the brain, the skin was dissected off it upon the sides, making flaps that would come together, and the tumor was amputated close down to the skull, after the pedicle had been ligatured with catgut. There was very little leakage from the wound, and there was no difficulty in closing the flaps tightly over the stump. A dry dressing was applied and the patient made a rapid and uninterrupted recovery, without ever developing any symptoms of nerve irritation.

Dr. W. F. Whitney made an examination of this tumor and found that it consisted outwardly of a sac covered by skin. Beneath this was a fibrous layer, externally well vascularized, which recalled in its histological character the pia mater. Adherent to this were fragments of tissue, the peculiar folded character of which recalled the structure of the cerebellum, and this impression was strengthened by the similarity of cellular arrangement, although the large ganglion cells [Purkinje's] could not be found. In a few of the small pieces removed separately the cerebellar structure was even more marked. The growth was a cerebellar encephalocele.

In Sajous' Annual for 1889, Senn has collected four cases of similar operation for meningocele, with but one death. In the absence of a pathological report of these cases, it is possible that in some, of them portions of brain tissue may have been present in the walls of the cyst.

The instances of the removal of tumors shown to be encephalocele are few, too few to enable us to decide the rate of mortality for the operation, but a sufficient proportion of them have been successful to show that in a good share of cases the survival of the patient may be looked for, provided the operation is conducted aseptically. A fortiori, the same is true of meningocele.

The failure of any good result from the injection of iodine in this last case is entirely in accord with what has been elsewhere observed in these tumors of the cerebral meninges.

The following extracts from a personal letter from Mr. Horsley, in regard to the treatment of this class of cases, will be of interest:

"In most cases of cephalic meningocele, I believe that, if taken early, they could be cured by compression, as Lallemand's original case was in the last century." Speaking of later cases, he says: "As regards cephalic meningocele, I think, where practicable, it should be excised, if, as in one case I had, it is situated at the nasal suture. I think, with a view of avoiding sepsis, it can, as I have shown, be very readily treated by electrolysis. As regards cases in which encephalocele exists, I quite agree that the projecting portions of brain substance had better be excised, as in a very severe case which I published some years ago in Brain, in which I tried to cover over the projecting mass, the result was unsuccessful; and, considering the abnormality which such portions of the encephalon exhibit, I think they are not worth preserving."

ABSCESS OR ANEURISM.

By J. K. BARTON, F. R. C. S.,

OF DUBLIN.

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THE diagnosis between an aneurism and a deep-seated abscess in the same region, has always been a subject of great interest to the practical surgeon, and much as we may pride ourselves upon the modern advance of our art, yet cases still occur in which this old question arises again, or causes great differences of opinion. In the case I am about to relate, so nicely were the signs balanced for aneurism and a great abscess, one for abscess, or against aneurism, that more than one-half the staff of the hospital stood boldly for the diagnosis, which finally proved erroneous—by that of aneurism—for it was an abscess.

In the case of a popliteal aneurism, an abscess may very closely simulate its signs, when the purulent collection is deep, bound down by the deep fascia; under these circumstances so much pressure may be made by the confined matter, as to retard the circulation in the artery at least to some extent and thereby simulate one of the most reliable signs of aneurism. For I take it that the most certain diagnostic signs of aneurism are; first, the effect produced on the circulation beyond the limits and the *distensible* pulsation of the tumor. While those of abscess on the other hand are: first, deep fluctuation; second, superficial cedema. In the extremities either upper or lower, these will usually guide aright, but in the thorax and abdomen, they no longer equally apply.

The late Mr. Dease's case has a striking illustration. It was a case of ilio-femoral aneurism in which suppuration had taken place, on viewing the tumor Mr. Dease gave his opinion that it was an abscess, and although his colleagues held an opposite view.

He plunged a bistomy into it, purulent matter flowed out, and Dease looked up with a triumphant expression, but in a moment this was followed by a fearful rush of arterial blood, which quickly terminated the patients life.

I will now relate the particulars of the case, which has led me to make these remarks.

Richard Latimer, 18 years of age, a very hale young man, was admitted in January 19, 1891, into the Adelaide Hospital under Dr. Beatty's care. Since the previous April, that is, eight months before his admission, the patient has been suffering from pain in the left side, extending down both arm and leg of that side, but most severe in the side of his chest. This pain got worse when he lay down in bed; so much so that he used to arch his back forwards to obtain some relief. He noticed a swelling in the upper part of his left chest wall for the first time on Sunday, the first of December, 1890. He was going to bed, when this swelling was noticed. Next morning he went to the neighboring dispensary when Dr. Falkner saw him, and he says gave him a plaster to put on the tumor. He was a printer by trade. He now abandoned his employment, that being ordered, and since has had much less pain. When questioned as to any injury having been inflicted on his chest, he remembered that in March, 1800. just a month before the pain began, a very heavy iron bar had fallen against the front of his chest.

Dr. Falkner discovered pulsation in the tumor and advised him to go to the hospital. Upon examination a pulsating tumor about the size of half an orange was found projecting from the chest wall, at the upper part of the cardiac region. The pulsation is systolic and the 2d sound is accentuated over the tumor, but except this there is no murmur. No râles are heard through the lungs, but there is very feeble breathing all through the left lung and over the posterior part of it. There is dullness on percussion. The side is not at all retracted. The pulse is the same on both sides, and seems of equal volume. The sphygmoscopic tracings of each had the same characters, there was a little marked decrotic curve.

Feb. 15. The tumor has greatly increased in size during the past month. Its measurments are now as follows: vertical, 4½ inches; transverse, 3¾ inches. There is a strong pulsation over it, and to the fingers placed on either side of the tumor this pulsation has a very expansile or distensile feeling. The next important point regarding this tumor is that it is very tender to touch, the patient wincing or even crying out when it is pressed or handled, and further fluctuation can be distinctly felt in it. The left side of the chest continues dull on percussion, except just along the spine, where the note is clear;

the chest expands very sluggishly on the left side; breath sounds under left clavicle are feeble and almost inaudible laterally and posteriorly. Temperature, normal.

Feb. 16. A consultation was held and the diagnosis as between abscess and aneurism discussed.

In favor of the latter, or aneurism, were: First, the strong pulsation; second, its distensile character; third, the clearness of the cardiac sounds; fourth, the accentuation of the 2d sound.

For abscess were: First, the age and strumous appearance of the patient; second, the position of the tumor; third, the great tenderness; fourth, local ædema.

In view of these signs, it was determined to puncture the tumor with a hypodermic needle and thus demonstrate its contents. accordingly did then and there, and slowly drew into the glass cylinder PUS. At once a free opening was decided upon and the patient was carried down to the operation theatre, there placed fully under the influence of ether, and with the aid of my colleagues, I proceeded to lay open this pulsating, purulent collection. Although I gave my advice strongly for this mode of treatment, yet I confess I never felt more nervous at any operation. Although no doubt could now be entertained that we had to do with an abscess, yet it looked so like an aneurism that I felt very queer, and when having made a free incision a dark greenish matter came freely out, my assistant drew back, muttering "larnociatea fetrise." But no, it was dark sanguine pus. I washed out the cavity with a boric-acid solution very thoroughly and then introduced my forefinger to ascertain if possible the extent of the cavity. I found a cavity about the size of an orange, but with an opening at its left posterior side, which may have communicated either with the pericardum or left pleura. I made no further investigation on this point. But having washed the cavity again, I drew the edges of the sac up to the skin, and secured complete drainage by stitching the opening in the sac to the skin, at the lower end of the wound. It could not be drawn together by deep or superficial sutures.

He improved very markedly after the operation and gained in weight. His temperature varied very much, sometimes as high as 101°, more frequently normal. The wound continued to discharge a weak pus, but not in any great quantity. The left lung, which had been dull on percussion, became resonant, and respiratory murmur was again audible through it.

He went to the Convalescent Home, when the summer came, and for a little time seemed to be gaining health. A cheesy, strumous discharge continued to come from the wound. Small

strumous suppurations took place in several places, and the urine was found to be very albuminous. He died during the summer.

Mr. Going conducted the post-mortem examination, and reports as follows: On laying open the chest the operation incision was found to lead to the cavity of the left pleura, there was no opening into the pericardium. The pleural cavity was almost obliterated by dense adhesions between the visceral and parietal layers. The sinus led into a space on the anterior surface of the left lung, surrounded on all sides by firm adhesions. This space contained a quantity of curdy, purulent matter. The back of the left lung was also bound down by adhesions, but they were comparatively easily broken down. Under the parietal pleura was found, here and there, masses about the size of a hazel-nut, each of a cheesy, strumous matter.

Over the whole of the right lung and more especially in front were very distinct adhesions; so much so that the lung tissue had to be cut away to open the chest.

On opening the pericardium a small quantity of sero-sanguineous fluid escaped; the pericardium was covered with a thick honeycomblooking substance which formed a tough membrane lining to it. The heart when its cavities were opened, was found free of any valvular disease, the muscular tissue seemed atrophied; extensive amyloid degeneration was taking place in both kidneys, liver and spleen.

In order that the interesting lesson in diagnosis taught by this case may remain clearly in all our minds, I would conclude the record of the case by reminding my hearers that the true nature of the case appeared when full weight was given to the age, temperament and constitution of the patient. Looking at the young man and considering his constitutional tendency, it became evidently much more likely that he should suffer from abscess than from aneurism.

IS AMPUTATION EVER INDICATED IN COXITIS?1

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HAVE no intention of describing the methods and dangers of amputation in the hip-joint, but simply to inquire into its indication in coxitis. That it has often been done we may learn from the table in the International Encyclopædia of Surgery, 276, had the operation done on account of disease, 65 of which, at least, had coxitis and many of which had been previously resected. Ashhurst gives a table of 34 cases of primary and 31 cases of secondary amputations for coxitis (probably the same 65 cases mentioned) with a mortality of 31 per cent. He states that the mortality is almost exclusively due to constitutional conditions and very little dependent upon the management of the wound. Primary amputation for coxitis will, of course, be abandoned as surgeons, little by little, learn the indications for excision and also that, done at the proper time, this operation is not dangerous and the results quite excellent. It is therefore only with the secundary or consecutive amputation that we have to do, the indication for which, according to Ashhurst, occurs when after excision the discharge increases and it is evident that caries has recurred and is too extensive for spontaneous recovery or re-excision, or when, with the same conditions, the patient's general health begins to fail—We may properly ask, what the cause is for this increased discharge and the recurrence of caries? The increased discharge depends probably in all cases on improper antiseptic precautions and on the imperfect exstirpation of the tuberculous capsule, pieces of which have been left behind, and it may be prevented by exercising due care in this regard during the operation.

The recurrence of the caries is probably less a recurrence than a continuation of the original trouble, particularly in the

¹Read before the Central New York Medical Association at Syracuse, May 31, 1892.

form of a chronic osteomyelitis in the shaft of the femur, and it is about the treatment of this particular affection that I wish to offer a suggestion in this short paper.

In some of my earlier resections for neglected cases of coxitis I have occasionally found a chronic osteomyelitis and osteitis extending all the way down the shaft of the femur to the lower epiphysis. The periosteum was found thickened, swollen, and so easily loosened from the congested and osteoporotic bone, that the whole shaft could be forced out of the wound, leaving the periosteum intact like the finger of a glove. Necessarily we would in such a case find continued suppuration and recurrence or rather continuation of the carious process, unless we removed the whole diseased shaft, in which case, if we succeeded in healing the wound, we would get a useless flail-joint.

It is obvious that to make a resection and leave the diseased bone behind is useless, and to remove the whole diseased shaft produces a useless limb. Amputation has so far been the only resource and the various text-books on surgery recommend this proceeding under the circumstances mentioned. And yet, by a very simple, easy and reasonable operation we are able to overcome this complication, if I can judge from a couple of cases lately operated upon.

Case No. 1. Augusta P., aged 11 years, entered the Sisters of Charity Hospital on February 12, 1892, with the following history: When six years of age she fell down stairs, injuring left hip. She has since complained of slight lameness until last May, (1891), when it increased, accompanied with fever, pain in the knee, emaciation, etc. Left leg abducted, flexed and rotated outwards, marked lordosis and crepitus in joint. A large cold abscess over anterior part of femur.

The abscess was opened by incision, four inches long, the tuberculous membrane removed with sharp spoon, the wound closed with sutures. It healed by first intention and gave no further trouble.

The joint was thereafter resected by posterior incision, the bone being cut through above the trochanter minor. The head was found loose in the joint, the synovial membrane of which was tuberculous and was removed. The whole neck and trochanter was in a state of chronic osteitis, no particular primary lesion being found. A chronic osteo-myelitis was found extending down through the shaft to the

lower epiphysis, the cavity being found filled with tuberculous masses, softened bone and fluid fat. The periosteum was swollen, thickened, and could with ease be detached from the dark-red, congested bone. I decided to treat this complication in the same way as I would treat an acute osteo-myelitis and therefore removed the whole marrow and all the softened bone with a long sharp spoon. made thereafter with chisel a counter-opening into the cavity of the femur above the external condyle near the epiphyseal line, brought a strong piece of silk thread through by aid of a long probe, and after a thorough disinfection of the cavity with corrosive sublimate, introduced by aid of the silk thread a long meche of iodoform-gauze through the whole femoral canal and out through the resection wound. The acetabulum was thereafter plugged with iodoform-gauze, the wound partly sutured and an antiseptic dressing and a Volkmann's sliding splint with 5 lb's weight applied. The wounds were dressed every six days under narcosis for four weeks, a new meche of iodoformgauze being introduced each time by being attached to the old one before it was removed. As the wound then looked perfectly healthy, it was omitted and the wound then closed rapidly. The extension was discontinued on April 15, a plaster cast applied on May 4, and on May 10 she left the hospital on crutches in excellent health, having gained twelve pounds in weight. The shortening was one inch, the joint firm and freely movable, all wounds healed. She will not, of course, for three or six months, be allowed to use the limb.

Case No 2.—Thomas M., aged thirteen, entered the Sisters' Hospital, on March 17, 1892, with the following history: He began to complain in April, 1890, of pain in the left knee, limping, had fever, starting pains at nights, and emaciated rapidly.

A plaster-cast was applied by an orthopædic surgeon and allowed to remain on for three months, the child meanwhile walking on crutches. An abscess was then found on anterior part of femur and was lanced, but did not heal. He continued under same treatment till July, 1891, and has since then been wholly neglected.

On entering he was extremely emaciated and anæmic, walks with two crutches. Left limb adducted and flexed, apparent shortening with marked lordosis. A sinus was seen in Scarpa's triangle, discharging curdy pus. Under narcosis the sinus was enlarged and was found leading to the joint, which was then resected by posterior incision, the bone being severed above trochanter minor. The joint was found in a state of chronic arthritis, but not tuberculous, the cartilages being more or less transformed into a fibrous tissue,

forming strong adhesions and making the removal of the head quite difficult. The neck and trochanter were found in a state of chronic osteitis with formation of a number of cavities containing tuberculous material and bone detritus. The same condition was found extending through the shaft of the femur down to the lower epiphysis. The marrow was removed with a sharp spoon, a counter-opening made as in the previous case near the lower epiphysis, the cavity disinfected and an iodoform-meche introduced. It was changed once a week for five weeks and then discontinued as the wounds looked perfectly healthy. The wounds then closed rapidly. The patient has greatly improved, gained considerably in flesh. There is a good firm joint with free motion, shortening 1½ inches. He has not been allowed to get out of bed yet.

Since operating on these two cases I have found a similar treat ment advocated in the New York Medical Journal of April 23 1892, by Dr. C. T. Poore, of New York. He found the conditions described in twenty-one cases. In eleven cases he cleaned out the central cavity, introduced after disinfection a drainage tube in the counter-opening, and the result was nine recoveries and two deaths, one twenty-four hours after the operation from shock, another three years afterwards from amyloid degeneration. Of ten cases in which, the central cavity was not cleaned out, eight died and two recovered. In one of the eleven cases the whole shaft became enlarged but has never given any discomfort. With these results in view is it pertinent to ask whether amputation is ever indicated in coxitis?

NOTE ON THE DISSECTION OF A CASE OF LUMBAR HERNIA.

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URING the past winter an example of this rare form of hernia came under my notice in the dissecting-room of McGill University. The subject was a muscular male, aged about sixty, and not very fat. Whilst removing the skin and fascia during the dissection of the back (the first part dissected in our anatomical rooms), a piece of fat was seen protruding through the lower part of the left latissimus dorsi muscle near its outer border. This piece of fat, which was about the size of a small walnut, could be easily pushed back through a round hole which existed in the latissimus dorsi muscle and lumbar The opening was outside the margin of the external abdominal oblique muscle, but not in Petit's triangle. It was situated three inches from the vertebral spine, one inch above the crest of the ilium, and was opposite the intervertebral substance between the second and third lumbar vertebræ. protruded fat was covered by a very thin transparent sac. On examining the canal anteriorly it was found that it opened into the abdominal cavity almost immediately below the left kidney, and that a sacculated portion of the descending colon rested in a depression which existed here, and to it was attached a large epiploic appendix which protruded through the opening in the fascia and muscle as the piece of fat above described. hernia was not noticed until the skin and fascia were removed, though doubtless during life it could have been easily felt. The interest in the case lies in the fact that the hernial canal passed through the latissimus dorsi muscle and was not in Petit's triangle proper, which was well seen in this subject. According to Lesshaft this triangle is constant only in women and is not seen in young children. Such a hernia might have been mistaken for a fatty tumor during life and serious consequences might have ensued in the hands of an unskilful operator.

EDITORIAL ARTICLES.

SURGERY OF THE GALL BLADDER AND LIVER.

- M. Terrier presented an exhaustive review of the different operative procedures upon the biliary passages with their immediate and ultimate results, at the last meeting of the French Surgical Congress. 1
- r. Cholecystolithotripsy has been practiced only by Lawson Tait, Courvoisier and Mayo Robson, and consists of an exploratory laparotomy with crushing of the calculus through the intact bladder wall or the wall of the cystic canal, either with the fingers, or, if they are not sufficiently strong, using forceps whose blades are protected by rubber tubing.
- 2. Cholecystotomy, first performed by Marion Sims in 1878, has been done in two ways. First, cholecystostomy, that is, the establishment of a permanent fistula for the escape of the bile, and second, true cholecystotomy, where at the end of the exploration of the cavity the bladder is again closed.

The former operation has been done in two ways, that is, completing the whole operation at one sitting, and by dividing it into two stages. The latter method has been discarded.

In doing the operation at one sitting two methods have been employed—the incision directly into the gall bladder and the suturing of the borders of this incision to the borders of the abdominal wound; or, the bladder is first sutured to the margin of the abdominal wound and then incised. The true cholecystotomy is also performed in two ways. 1st. Cholecystotomy with buried intra-parietal sutures. 2d. Cholecystotomy with buried intra-peritoneal sutures. In the first the bladder is fixed to the borders of the parietal wound and then incised, and finally closed by an extra-peritoneal suture of the vesicular wound. If a point of suture gives way when

¹Revue de Chirurgie.

this method has been employed the bile escapes outside and not into the abdominal cavity.

In the second, the vesical is incised first, then this incision is sutured and the whole returned to the abdominal cavity, which is then closed. This is the ideal cholecystotomy of the Americans, the cholecystotomy with buried sutures of the French, the cholecystendyse of Courvoisier. The suture of the bladder is important; the Lembert or Czerny methods are usually employed. Lareta used a suture in two stages. Woelfler and Sänger imagined that they could docholecystendyse in three stages.

- 3. Extraction of the calculus from the cystic canal after cholecystotomy may be quite simple and may be performed with curettes, &c. Sometimes the calculi are broken up, crushed where they are lying; cholelithotrity.
- 4. Cholecystectomy. The ablation of the gall bladder has been done quite frequently. Calot collected 78 cases, and by adding those done since, the number reaches about 90, with a mortality of less than 20 per cent. This operation, easily performed when the parts are normal, may become very difficult and laborious. The indications for it are difficult to determine. It is indicated where there is hydrops vesicæ with obliteration of the cystic canal; when the gall bladder is inflamed and full of calculi and especially when the efforts to remove the calculus from the cystic canal have occasioned partial destruction of the walls. Biliary fistulæ, particularly those resulting from obstruction of the cystic canal, should also be treated by cholecystectomy. The operation is contraindicated in cases of obliteration of the ductus communis choledochus.
- 5. Cholecystenterostomy. The point where a fistula should be established between the gall bladder and the intestine is important. The colon should not be used, and the duodenum should be preferred. It is only in cases where nothing else is available that a loop of small intestine should be employed. This should be the loop nearest to the gall bladder. The operation should be completed at one sitting. Two openings, of equal size should be made, one in the gall bladder, the other in the intestine, and these should be brought in apposition by two rows of sutures, one above the other (Colzi's method). The

gall bladder and intestine may, on the other hand, be sutured together and the incision made just before fastening the last sutures (Terrier's method).

The operations practiced upon the principal Biliary Passages are:

- r. Choledolithotripsy consists in crushing the calculus, obstructing the ductus communis choledochus in situ, and without incising the walls of the canal. Out of seven operations of this kind only one has failed, the procedure, however, exposes the duct to the dangers of rupture.
- 2. Choledochotomy. The incision of the ductus communis choledochus may be made for the simple extraction of the foreign body—true choledochotomy—or for the formation of a biliary fistula, choledochostomy.

Choledochotomy has been practiced with great success. Suture of the duct must be done with great care, and two rows of superimposed silk sutures should be employed.

Choledochostomy (Parkes) has been done only rarely, as the indications for the operation are seldom present.

Choledocho-enterostomy consists in an anastomosis of the common bile duct with a loop of small intestine, preferably the duodenum. It is possible only where the duct is very much dilated.

Hepaticostomy (incision of the hepatic canal) and hepatostomy (incision of the liver and intra hepatic canals) are exceptional operations not worthy of consideration.

Terrier's personal experience has been in 14 cases, 8 cholecystectomies, 1 cholecystotomy, 3 cholecystostomies, 1 cholecystenterostomy and 1 choledochtomy.

M. Terillon¹ reported eight cholecystotomies, with six recoveries, one death after one month, and one persistent fistula. He had also performed cholecystectomy twice, with a recovery in each case, and once found the gall bladder so bound down by adhesions that cholecystotomy or cholecystectomy were impracticable, and he therefore contented himself with the exploratory laparotomy.

M. Leonte (of Bucharest) reported two cases, the first of cholecys totomy, and at the end of six months cholecystectomy in consequence

¹Also Bull. gen. de Therapeutique, June 1892.

of a permanent fistula. In the second the ideal cholecystotomy was performed. The determination of the operative procedure in this case had been influenced by the good condition in which the vesicular walls were found, and by the permeability of the excretory canals. Both cases gave good results.

He advanced the following propositions:

Surgical interference is indicated, when medical treatment has not been successful, in cases of chronic cholelithiasis, of calculous tumors hydrops and empyema vesicæ, or for temporary or permanent lesions of the cystic canal and ductus communis choledochus. With antiseptic precautions this surgical interference is not serious.

Cholecystectomy should be performed as rarely as possible, unless especially indicated by the existence of a malignant growth.

Cholecystotomy with the establishment of a cysto-cutaneous fistula, is an inoffensive operation which can replace primitive cholecystotomy; where the fistula lasts for a long time, and it is impossible to overcome the occlusion of the cystic canal secondary cholecystectomy should be performed.

Ideal cholecystotomy is preferable to all other operations where the walls of the viscus are not changed and where the canals are permeable.

Cholecystenterostomy is preferable only when there is irremediable occlusion of the ductus communis and a persistent fistula following cholecystotomy, where one cannot remedy the fistula nor extirpate the bladder. For an accurate diagnosis it is always necessary to open the gall bladder, external exploration is insufficient. Catheterism is a laborious and dangerous operation. From the recorded observations the results quoad vitam et quoad functionem plainly favor interference.

M. Michaux, of Paris, performed two of the first cases of cholecystectomy in France, one three years and two months ago, and the other two years and two months, and the final results are excellent. These results correspond with those of other observers. And we may, therefore, conclude that cholecystectomy is an excellent operation. In all cases where it is indicated and possible, it is superior

to all the lithotrities in the bladder and biliary passages, and also to cholecystotomy.

At a recent meeting of the London Medical Society, Mr. Knowsley Thornton read a paper in which he gave particulars of five cases of cholecystotomy. He maintained that a properly conducted exploratory incision was free from risk and might give valuable information, even when no stone was found. Dietetic and medicinal treatment ought, however, to be thoroughly tried first. The ducts were as completely within the sphere of surgical treatment as the gall bladder itself. Stones of moderate size impacted in the duct were better treated by kneading and crushing between the finger and thumb, or by forceps pressure; larger stones by incision, complete removal, and after-suture of the duct wall. In cases in which débris was left in the duct the gall bladder should be opened, sutured to the abdominal incision, and drained. Where the ducts were incised and sutured a drainage-tube should be passed into the peritoneum beside the sutured duct, and the gall-bladder also drained externally. In a well-marked case of repeated attack of gall-stone colic, with recurring distension of the gall-bladder, it was better to operate early, and before there was a chance of injury to the duct-wall by impaction, and before the stone had reached the common duct. Such cases recovered rapidly, and there was every prospect that experience would show that complete intraperitoneal suture of the wound of the gall-bladder would be safe, and would become the rule when operation preceded damage of the ducts by impaction.

Reeve¹ reports three cases of cholecystotomy: one resulted in a biliary fistula which was closed by a second operation; the second was done in two sittings, the gall bladder being fastened into the abdominal wound and incised six days later; the third operation was upon the same patient as the second. At the end of five months after the first operation the symptoms had recurred so that she applied for relief again, and a second stone was removed. Cholecystectomy was considered but was not feasible owing to the dense adhesions, and so the following was employed: "A drainage-tube was placed within the lips of the incision in the liver and surrounded by a little gauze.

¹New York Med. Journal, May 28, 1892.

The fragments of the fundus of the bladder were gathered together and stitched in the wound, a silver wire being placed between them, and reaching to the outside to conduct out the mucus which it was expected would still be secreted from the mucous lining. Pain was not overcome until some time later when it yielded to electricity, but a fistula persists." The first case illustrated, he thought, the fact that the concretions are not advanced through the duct by fluid pressure alone, but possibly by a peristalsis of the muscular coat of the duct.

In the The Boston Medical and Surgical Journal of April 28. 1892, Dr. Maurice B. Richardson reports several cases of surgery of this region. Four were cases of cholecystotomy for gall stones; in one the gall bladder was so tied down by adhesions and retracted that it could not be fastened to the abdominal wall, but the upper lip of the incision was drawn up to the parietal peritoneum, while the lower was left loose. A glass drainage-tube was placed in the gall bladder and iodoform gauze packed about it. The abdominal cavity was thoroughly irrigated with warm water and the wound left partly open. The lower half was brought together with wire sutures and the upper half packed with gauze around the tube. In the evening the dressing was stained with bile, which escaped freely from the tube on its re-Thirty-six ounces of bile were siphoned off in the next twenty-four hours. One month after the patient died septic owing to an abscess formed about a gauze sponge which had been left by mistake in the wound. During the operation there was an abundant escape of bile, much of which covered the intestines and escaped into the peritoneal cavity. This emergency was met by putting a tube into the hepatic duct and tying the gall bladder, or its remains about the glass tube, and this method has been successful in several cases. The immediate effect of the introduction of the tube with the gauze packing was to shut off the rest of the abdominal cavity. On removal of the gauze, the general cavity of the abdomen was entirely and firmly protected by recent adhesions. In one of the other cases there was also an inundation of bile over the contents of the abdomen, but both cases had no symptoms referable to this accident. Five of these cases were cholecystotomies and one a cholecystectomy. Only one of the cholecystotomies died; all the others were cured except one, where there is a permanent fistula that will require an operation.

The effect of bile escaping in large quantities into the wound seems to be negative. In no case has there been any ill effect. It must have escaped in considerable amounts in the region of the gall bladder in most of the operations. The anatomy of the parts, however, would tend to confine the fluid to the immediate vicinity of the foramen of Winslow. The transverse mesocolon and the hepatic flexures of the colon prevent its escaping except in the right flank. The duodenum, pyloric end of the stomach and the lesser cavity of the omentum through the foramen of Winslow, would be the only parts immediately invaded, and all these are apt to be shut off by adhesions in long standing cases.

Patients suffering from symptoms of hepatic colic who have advanced into a profound cholæmia do not offer as favorable a prognosis as more recent cases, nor are they so favorable for operative interference. The stone is likely to be larger and the danger of ulcerative processes greater, and the patient seems to run greater risks from attempts at relief, the results have been so good even in this class of cases that we should advise all patients when a moderately certain diagnosis has been made, that after waiting a reasonable time for nature to effect relief, the chances for recovery and usefulness are better when we resort to modern surgical art.

In a case operated upon by Dr. W. W. Keen, of Philadelphia, the diagnosis lay between gall-stone and cancer, probably of the pancreas, exploration through the mesentery and down upon the pancreas, revealed no cancer of the pancreas at all, but a perfectly normal one; but immediately back of the pancreas still a hard mass was to be felt. With the fingers and a pair of hæmostatic forceps the pancreas was bored through and back of it a hard, nodulated mass was found which was recognized as one or more gall-stones, presumably the gall-bladder, but lying directly across the spine. On opening this one large and five or six small stones were removed. A drainage-tube was inserted, but not surrounded with gauze. In one other case Dr. Keen has found the gall-bladder considerably displaced. In that case also it lay transversely and immediately in front of the spine, but not behind the

pancreas. It could be reached readily without passing through any structure.

Undoubtedly no glass drain, even if surrounded with gauze, will carry away, either through the tube or through the capillary attraction of the gauze, all of the bile. There must be more or less of it that will escape among the intestines during that period in which tubular drainage is being established by agglutination of the intestines around the gauze that is placed outside of the tube. Therefore, we have here decidedly confirmatory proof of the fact that the escape of bile into the peritoneal cavity is not necessarily a fatal occurrence.

¹The development of the possibilities of benefit from the anastomosis of the gall-bladder and the common bile-duct with the duodenum and other divisions of the intestinal canal has lately occupied the earnest attention of surgeons. When the natural outlet for the bile becomes obstructed, it is recognized as proper to effect an artificial passage for it into the intestine. A new departure in operative measures consists in connecting the walls of the common duct with the duodenum, as was done in a case reported in the *Deutsche Medicinische Wochenschrift*, September 3, 1891.

A woman, forty years old, suffered from the usual symptoms of biliary obstruction. After the abdomen was opened, the cystic duct was mistaken for the common duct, and the latter for the duodenum. A stone found in the first was pressed into the distended common duct, and the passage was supposed to be free; but in a subsequent operation, a stone was found in the cystic duct and a second at the portal channel; the second stone was crushed. The common duct filled immediately with bile, and in order to provide an outlet it became necessary to connect the walls of the duct and of the duodenum, by incising each and bringing them together with stitches. In doing this, some bile necessarily flowed into the wound, but no serious disturbance followed. Three months afterward the patient had recovered from all trouble, and it is to be inferred that the communication between the common duct and the duodenum was maintained.

¹J. McFadden Gaston, M. D., Surgery of the Gall-Bladder and Ducts. *Medical News*, June 11, 1892.

It would appear, that all cases of obstruction of the cystic and common ducts by gall-stones, call for their dislodgement by one or another procedure, to afford an outlet for the bile; and that the attachment of the incision in the gall-bladder to the opening in the wall of the abdomen, leading to a discharge of the bile externally, should be regarded as a mere temporary recourse. In the event of failure to effect an outlet for the bile through the common duct, cholecystenterostomy is clearly indicated.

As to the portion of the intestine that should be selected for the attachment of the gall-bladder or the ductus choledochus, we have a definite guide in the entrance of the bile naturally into the duodenum; and the nearer to this point that an anastomosis can be effected, the better the result that may be expected.

It is, of course, presumed that there is such an occlusion of the common bile-duct as to prove irremediable by other means, before proceeding with an operation to effect an outlet for the bile by uniting the gall-bladder with the intestinal canal. A misunderstanding of this condition has led to misapprehension of the end to be attained by duodeno-cholecystostomy or cholecystenterostomy; it is only warranted by occlusion of the common duct.

All of our resources being exhausted without relief to the impediment for the discharge of bile through the ductus choledochus, and finding the integrity of the gall-bladder favorable for its attachment to some portion of the intestine, we may rest assured that we shall be able to effect an opening from the former into the latter by which the bile shall subserve its legitimate purpose in the animal economy.

To Nussbaum is attributed the first suggestion of relieving the occlusion of the common bile-duct by conveying the bile into the intestinal canal through artificial openings in the adherent walls of the gall-bladder and the intestine; but the credit of having first accomplished this result upon the human being is undoubtedly due to Von Winiwarter.

We are informed that between the 20th of July, 1880, and the 14th of November, 1881, he treated for sixteen months a man, aged thirty-four years, who suffered from obstruction of the common bile-

duct, and who was subjected to six different operations for the formation of a fistula between the gall-bladder and the colon.

All kinds of difficulties thwarted this undertaking, but it is claimed that the surgeon eventually succeeded in attaching the gall-bladder to a coil of the small intestine, and effecting a fistulous communication, by which the bile escaped into the intestinal canal, thus obviating the inconveniences of an external outlet.

After a lapse of six years, during which the various experiments on dogs by Colzi, Page, and Gaston, were performed, Monastyrski united the gall-bladder with the jejunum, on the 4th of June, 1887. He incised the abdominal wall, punctured the gall-bladder, incised its walls and those of the jejunum, and sutured the edges with catgut. A fistulous communication was secured two meters below the duodenum, but death ensued ultimately from carcinoma of the head of the pancreas, as verified by the autopsy.

The operation of Kappeler came next in the order of time, being done on the 6th of July, 1887, by uniting the gall-bladder with the ileum by Woelfler's suture. The patient progressed favorably for a time, and returned to work, but eventually died on September 9, 1888, fifteen months after the operation. The autopsy showed that a fistula had been established about eight feet from the ileocæcal valve, and that its intestinal orifice was provided with a valve that allowed the contents of the gall-bladder to pass into the intestine, but prevented the passage of intestinal contents into the gall-bladder. Doubtless a similar provision exists in all such cases.

In the year following the operation of Kappeler, Fritsche established a fistulous opening from the gall-bladder into the jejunum, three meters below the pylorus. At the post-mortem examination a carcinoma of the size of a walnut was found at the common bile-duct. Socin and Bardenheuer each attached the gall-bladder to a loop of the small intestine. The case of the latter died in the fourth week, and no fistula was found. It is said that the operation was done with elastic ligatures.

On March 2, 1889, Robson operated upon a patient that had previously been subjected to cholecystotomy, where the ducts and the gall-bladder were found attached to the abdominal wall by firm adhesions. The common duct subsequently becoming occluded, an incision was made through the scar from the former operation, in the semilunar line, and it was found that the attachment of the gall-bladder could only be effected with the colon. Both were incised, and united with chromic catgut in two rows. The former external fistula was closed by suture, and a drainage-tube was inserted in the wound. After one day, bile came out of the drainage tube, and also fecal matter from the intestinal wound. In spite of this complication, a speedy recovery, with the appearance of bilious matter in the feces, is reported.

On July 13, 1889, Terrier performed an operation for the relief of occlusion of the common duct. An incision was made in the median line above the naval. The gall-bladder was punctured and the contents evacuated. Upon incising its walls and exploring its cavity no stones were found and the cystic duct was pervious. In the oblong enlargement of the common duct was impacted a gall-stone which could not be removed. After attaching the gall-bladder to the duodenum by circular or oblong row of catgut sutures and before tying the last stitches, the walls of both were incised and a rubber drainage-tube was introduced, so as to pass from the cavity of the gall-bladder into the duodenum. The fundus of the gall-bladder was sutured to the lower angle of the external incision, which was then closed by catgut sutures. There was fever until August 1st, but the itching and jaundice gradually disappeared. The drainage-tube passed off with the evacuations nine days after the operation, and the stools gave evidence of the presence of bile. The external wound healed by first intention. The patient was dismissed on August 10th in ordinary health.

This patient died in the spring of 1890 from influenza and no gall-stone was found in the common bile-duct.

Courvoisier, in like manner with Robson, performed the operation of natural cholecystotomy upon a patient, without obtaining a satisfactory result. After the lapse of a year, complications arose that demanded the performance of cholecystenterostomy, and this was done on the 28th of March, 1890. An incision was made through the abdominal wall, below the ribs, along the border of the liver.

The gall-bladder was detached from the abdominal wall, and after incising the sac, the gall-stone was removed from the common duct and others scooped from the hepatic ducts.

An incision into the lower surface of the gall-bladder was united to the colon by an oval row of catgut sutures, and before putting in the last stitches the wall of the colon was incised. The fistulous parts of the gall-bladder were cut away and the edges stitched. Two drainage-tubes were inserted and the external wound was closed around them. There was no fever after April 2d. Bile was found on the dressings, but its source was not determined. Bile appeared in the stools on the 6th of April, and on the 8th the drainage-tubes were removed and the external wound was sutured. On the 15th of April the patient was free from jaundice and got up feeling very well. The case was dismissed about the middle of May, and in the middle of July her condition was excellent. There was no more colic or jaundice.

Courvoisier thus sums up the result of these seven cases: One case operated upon died, as a consequence of a complication which should not be charged to the method. All the others recovered from the operations, but in four of the cases the carcinomatous condition of the pancreas caused death at a later period. A definite final cure is claimed only in the cases of Robson and Courvoisier, in which, it will be remembered, the gall-bladder was attached to the colon, not by choice but from necessity.

The practicability of effecting an outlet from the gall-bladder into the intestinal canal can no longer be doubted, and in the view of Courvoisier it stands more and more securely as the details from trustworthy sources become more widely disseminated.

The indications for the operation are formulated by him as follows:

- (a) When biliary fistulæ are difficult of removal, whether traumatic, ulcerative, or operative.
- (b) In permanent obstruction of the common bile-duct (except in cases of gall-stones).
- (c) In traumatic and ulcerative communications between the common duct and the abdominal wall.

Operation is contra-indicated:

- 1. When the patients have grown very feeble, in which cases provisional cholecystostomy might be performed.
- 2. When the common duct is obstructed by gall-stones, in which cases cholelithotomy, with stitching or lithotripsy, is indicated.

Helferick1 has reported a case of cholecystenterostomy, where after chloroform narcosis, the abdomen was opened by an incision parallel to the lower margin of the liver, but placed a little higher up. Another incision extended upwards in the median line to the ensiform cartilage. The intestine protruded, and had to be kept in position by warm sterilised mull. The edge of the liver was lifted by an assistant. The gall bladder was free, small, pear shaped, moderately distended, and no gallstones could be felt. Its base was adherent to the liver; one could not think of lifting it up, or even to bring it to the level of the wound. Stones could be felt in the common duct, and lying close together. They were so deep and fixed that it seemed to the operator technically impossible to open the common duct, with subsequent stitching of its walls. He determined to perform cholecystenterostomy, merely as a palliative measure, and executed the operation at once. This proved very difficult, as it had to be carried out in the deeper part of the abdominal wound. An intestinal loop, close below the bend of the duodenum, was opened and washed out outside the abdominal cavity. Two rows of fine silk satures were employed, the opening made in the intestine being the thickness of a pencil. After carefully returning the intestinal loop, the abdominal wound was stitched in layers, not without difficulty, an unusual amount of tension in the parietes having to be overcome. The patient at the end of two hours' narcosis was weak, but soon recovered; and the subsequent course was in all respects satisfactory. Two months afterwards the patient had fully recovered.

M. Richelot, of Paris, performed a cholecystenterostomy in the following conditions: A woman of 52, who had been ill for from eight to ten years, having for five months a persistent icterus due undoubtedly to an obstruction of the ductus communis choledochus by a cal-

Deutche med. Wochenschrift, No. 8, Feb. 25, '92, Med. Chron., June, 1892.

culus, multiple adhesions were found surrounding the biliary passages. These were deeply seated, difficult to explore and no calculus could be discovered. It was therefore decided to make a cholecystenterostomy; Colzi's method was employed; the opening into the gall bladder allowed the extraction of several calculi. Recovery from the operation was perfect. After a sojourn at Vichy, the icterus returned and she lost ground. Thinking that the opening between the gall bladder and the duodenum had closed, cholecystotomy was again performed. Considerable difficulty was experienced in this, owing to the adhesions and the retraction of the gall bladder. No trace of the vesiculo intestinal orifice could be found; the cystic canal was oblit-Suspecting a calculus, it was sought with forceps, when there was a sudden'jet of blood which was arrested by a tampon. The abdomen was hastily closed, but the patient died in one hour after the operation. At the autopsy the abdomen was found filled with blood. The forceps had seized a small calcareous deposit on the walls of the right branch of the hepatic artery. All the excretory canals of the bile were obliterated and transformed into a fibrous mass, the liver was engorged with bile.

Chavasse has reported in the Lancet an interesting case in which an anastomosis between the gall-bladder and the colon was effected by a process differing materially from the previous operations. A man, forty-eight years old, had undergone cholecystotomy for the relief of jaundice, dependent upon biliary obstruction by calculi, which was followed by the persistence of a biliary fistula. Other measures failing, with the aid of Senn's bone-plates a communication was established between the gall-bladder and the colon at its hepatic flexure. At first, bile and fecal matter were discharged through the abdominal wound, but ultimately this closed, the stools were passed naturally, and the general condition of the patient was much improved.

Koerte also reports a successful case of the union of the gallbladder with the duodenum, after the manner of Terrier, thus affording two favorable results from duodeno-cholecystotomy.

So far as the operations are to be considered, those of Kappeler and Terrier were successes, and being added to the other six cases with finally good results, we have eight cures of twelve in which the operation of cholecystenterostomy has been successfully performed, being a mortality of only twenty-five per cent. from the operations.

This encourages the expectations with improved methods of obtaining a satisfactory solution of the problem of relief for occlusion of the common bile-duct. While other means may be employed for correcting temporary obstructions of the ducts, the great desideratum in occlusion of the common duct is to provide an artificial opening from the gall-bladder or duct into the duodenum or the adjacent portion of the intestinal canal.

An especially interesting case of Resection of the Liver has been reported by W. W. Keen, M. D., of Philadelphia, in the Boston Medical and Surgical Journal of April 28th, 1892.

An oval tumor, about the size of a fist, was found on the right side of the abdomen, in the situation of the kidney, separated from the liver dulness by an area, three fingers broad, of distinct tympanitic resonance. By bi-manual examination pressure posteriorly is felt in front, and *vice versa*. The tumor was quite movable, moderately tender and of about the consistency of the kidney; no especially soft portion was found. The renal artery could not be detected. Diagnosis—probably a floating and diseased kidney. An exploratory operation was recommended.

Operation, October 9, 1891. Chloroform was used instead of ether, in view of the condition of the kidneys, as shown by the urine. Vertical incision in the right linea semilunaris, reaching nearly to the border of the ribs and nearly to the ilium. The incision was four and a half inches long. The moment the peritoneal cavity was reached a multiple cystic tumor was seen. The surface was reticulated by partitions between the cysts, the cysts being on an average about the size of the little finger-nail, some larger and some smaller. The color was a light bluish-white. The moment the hand was introduced into the abdomen it was discovered that the tumor had no connection with the kidney. The right kidney appeared to be somewhat smaller than normal but was in its right place. On drawing the tumor out of the abdomen, it was instantly seen to be connected with the liver, involving its extreme right border. In size it was three and a half inches vertically and nearly the same transversely. At its base,

where it joined the liver substance, it was two and a half inches thick. It was evidently a localized tumor. Just at its internal border was the gall-bladder, which was normal, but so close to the tumor that it was dissected loose for half an inch in order to operate with greater ease. A few small vessels required ligation at this point.

One stitch was passed directly through the liver-substance next the gall-bladder, the operation being begun here by reason of a very large artery which had been exposed but not wounded during the separation of the gall-bladder from the liver. Having tied the liver here, the effect of the Paquelin cautery was tried and it did so well that no further attempt to ligate the liver-substance was made. Four very large veins were laid bare, and were ligated before being burned through. When about half way through in depth, it was discovered that the neoplasm extended as a wedge into the liver to a greater distance internally than was apparent from the outside. Accordingly an attempt was made to strip the liver-substance from the tumor with the thumb-nail, which could be done with perfect ease and without serious hemorrhage. This enucleation left the tumor attached to the liver at its posterior border only, which was then burned through with the cautery. A few points required extra touching with the dull red platinum point. The liver-stump, roughly speaking, resembled that of an amputation with its two flaps. edges or flaps were then approximated by five sutures passed deeply through the substance of the liver.

The intestines had been protected meanwhile by a large flat sponge. This had kept the most of the blood out of the belly cavity, and the amount lost was estimated at six to eight ounces. The belly cavity was flushed with hot water, and the wound closed after inserting a glass drainage-tube. The operation lasted an hour.

After the operation, two doses of one-eighth of a grain of morphia hypodermatically relieved her pain, and one of one-fourth of a grain of cocaïne by the stomach checked her vomiting. From the drainage-tube in the first twenty-four hours about three ounces of bloody serum were removed, in the second twenty-four hours less than one ounce; and therefore at the end of forty-eight hours, the tube was removed. No bile or bile-stained fluid was seen

at any time. The bowels were moved on the second day by drachm doses of sulphate of magnesia, the stools being then and afterward of a normal brown color, without any visible disturbance of the hepatic function.

The temperature on the night after the operation rose to 101.2°, on the two following days to 100°, and after that was not above 99°, excepting during what was apparently a malarial attack, which began eleven days after the operation and lasted four days. During this attack the temperature rose to 101.2° again. The stitches were removed at the end of a week. In fact, with the exception of the malarial attack, her recovery was an uninterrupted one.

In concluding his report of this case Keen has tabulated twenty cases of resection or amputation of the liver, together with the analysis, which shows that in nearly all cases diagnosis was not made until after the belly was opened.

As to the method of removal, and especially the means of preventing hemorrhage, there was in the reported case absolutely no trouble in this respect. In nine of the tabulated cases after completion of the operation the stump was returned into the abdominal cavity. In three the lips of the hepatic wound were first sutured. Of these nine, all but one recovered. In six cases the stump was sutured to the abdominal wound at the close of the operation. In four the liver was attached to the edges of the abdominal wound before the removal of the tumor. In one case ligation of the pedicle fixation to the abdominal wall, and immediate amputation of the tumor was practised; but in the other three a true extra-peritoneal treatment was carried out. In one case the operation was performed in two stages,—that is, primary suture to the abdominal wall and a later amputation. In one case of the tabulation the result is not known; of the other nineteen, seventeen recovered. Of the two deaths, one occurred upon the day of operation, presumably from shock; the other on the twelfth day from sepsis.

Both experiments on animals and operations on man have shown that tumors of the liver, and even large portions of the liver itself, can be removed without undue disturbance of the function of the liver; the experimental evidence makes it probable that the liver tissue may be regenerated and the loss made good. The escape of bile into the peritoneal cavity is not a usual phenomenon after such an operation; it may generally be prevented either by searing the raw surface of the liver, by ligation, or by securing the stumps in the abdominal wound, and even if the bile does enter the peritoneal cavity, the result is not necessarily fatal.

Hemorrhage need not be greatly feared. The vessels can often be tied separately or in mass, or cut through by the cautery, or controlled by pressure or by a combination of these means.

The resection or amputation is best done by enucleation, by the cautery, or by the knife or scissors, preferably, perhaps, in the order named. In case of a tumor with a very large base of attachment, the operation may be done in two stages, the base being surrounded by an elastic ligature in the interval.

The mortality thus far has been only about ten per cent.

SAMUEL LLOYD.

PROF. WOELFLER (GRAZ) ON THE SURGICAL TREATMENT OF GOITRE.

Part III.

The methods of treatment of goitre with special reference to the cases treated between the years 1878 to 1884 at the clinic of Prof. Billroth (Vienna) and those treated by the author himself at the clinic in Graz, between the years 1886 to 1890.

- X. The Extirpation of Goitre.—The author gives the following definition: "I understand under extirpation of the goitre always only the methodical removal of half, three-fourths or the entire degenerated thyroid gland with typical ligation of the afferent and efferent bloodyessels."
- 1. Statistics of the Goitre-Extirpations.—The mortality after extirpation of goitre, according to Liebrecht, amounted up to the year 1851 (in 54 cases) to 31.4 per cent., decreasing till 1876 to 20.3 per cent. (in 133 cases) and from 1877 to 1882 it decreased to 14.6 per

cent. (in 164 cases). In Billroth's clinic eighty-four extirpations were performed between the years 1877 and 1884, excluding the cases of malignant goitre; of these only nine cases had a fatal issue. This brings the mortality down to 10.7 per cent. The mortality in total extirpation was 13 per cent.; in unilateral extirpation, 7.9 per cent. With the uniform progress and development of surgical technique, the mortality connected with this operation, also, decreased in other surgical clinics (10 to 15 per cent., Kocher, Brun, etc.). With the still further development of the technique of this operation and the improvement in the antiseptic treatment of the wound the percentage of mortality was in latter years still lower, 5.1 per cent. (43 cases, Kocher). Kocher, also, showed in an analysis of 230 cases of extirpation, performed within the few last years, that the mortality was even reduced to 1.3 per cent., and that extirpation of goitre becomes steadily less dangerous in the hand of skilful surgeons. The author, however, cannot agree with Kocher, that the extirpation of goitre is an operation perféctly void of dangers; as a number of circumstances come into consideration, which may cause a fatal termination. therefore, thinks that we have arrived at the end of our ability in regard to reducing the mortality following this operation. It will oscillate between 2 and 5 per cent. The results which were obtained by Prof. Billroth since 1884 will certainly be of special interest, and will, probably, be communicated in a short time. The number of cases operated upon by the author himself is not large enough to admit of statistic conclusions. He has, however, not lost a single case.

2. Value of Extirpation in general; Indications and Contra-Indications for its performance. W considers here the views held by certain physicians and surgeons in regard to the cachexia strumipriva in connection with partial or total extirpation of the thyroid gland, and regrets that a number of them, in spite of the most excellent results, question the necessity or justifiability of this operation and still recommend the simpler methods (tincture of iodine, application of cold, etc.). All surgeons coincide that in many cases the milder methods should be tried, and many a surgeon will again and again be obliged to have recourse to this or that temporary measure; but it

would be a great misfortune if we had no further operative measures at our disposal for the several forms of goitre. We would then be on the road of a deplorable retrogression, which would lead us not only back to the surgery of the beginning of the nineteenth century, but even back to the surgery of the end of the eighteenth century. All surgeons would gladly abandon extirpation, if they were given a procedure less dangerous and equally effective. It appears illogical to Woelfler to condemn a most beneficial operation, because we have among a hundred cases five unsuccessful ones.

"The number of those who perish, annually from 'goitre-asphyxia' is far greater than the number of those who die after the operation (extirpation); and the occurrence of sudden deaths among individuals afflicted with goitre would be still much more frequent if extirpation would not be resorted to."

Extirpation becomes a necessity under the following conditions:

1. If the goitre causes essential functional disturbances (interference with the respiration or circulation);

2. If the goitre grows very rapidly.

That extirpation of the enlarged thyroid gland is, also, admissible in *morbus Basedowii* and seemingly gives good results, has been shown by very recent experiments (Watson, Tillaux, Mikulicz, Krönlein).

Extirpation of the goitre is to be disadvised or, at least, to be regarded as a risk in the following cases, (the author refers here only to unilateral or incomplete extirpation): 1. In young individuals (æt. 12 to 14 years); 2. In old people (æt. 60 to 65 years or older); especially if the goitre is large and considerable hemorrhage and long duration of the operation is to be foreseen. If in such cases operation is not to be avoided, then we should restrict the operative procedure to those parts which are the real cause of the disturbance; e. g., the isthmus, a small retro-sternal or lateral portion; 3. It is the rule to extirpate goitres, which grow rapidly as soon as possible, but there are exceptions to this rule, e. g., cases of goitre, which enlarge very rapidly or even suddenly. To extirpate these would, under certain circumstances, be extremely dangerous, for the malignant tumors excepted, we frequently have in these cases to deal with a

severe hemorrhagic or inflammatory process. To wait is a much better procedure for these cases than extirpation or enucleation, as the patient is sure to perish from an uncontrolable hemorrhage or subsequent sepsis. Illustrative cases are quoted from Billroth's clinic. The author advises in certain cases incision of the inflamed tissues.

In regard to the surgical treatment of goitre in pregnant women, the author thinks that if respiration is very much interfered with in the early months of pregnancy, extirpation may be performed. If, however, cyanosis should appear in the latter months of gestation, he would advise tracheotomy and wait for the extirpation or enucleation until after labor.

In goitres of the new-born the author disadvises operative measures. Such cases improve markedly and spontaneously within a a few weeks. Should danger of suffocation appear then local application of cold leeches or tracheotomy should be resorted to.

Regarding the extirpation of the goitre in morbus Basedowii, Woelfler, after a careful and critical study of the results of the different surgeons (Billroth, Watson, Tillaux, Lister, Pean, Lemmke, Kroenleim, Terrier, etc.,) come to the following conclusions: "It seems to me that as yet we have not sufficient evidence that Basedow's disease can be cured by extirpation of the goitre. On the other hand, as far as embarrassment of respiration is concerned and whether extirpation may be performed in morbus Basedowii if such is present, experience shows that the disease is not aggravated by the extirpation, but the latter removes the embarrassment of the respiration. Therefore, extirpation of the goitre in morbus Basedowii with co-existing dyspnœa is not contra-indicated."

3. Anæsthesia in Goitre—Operations in general. The author considers the combined "anæsthesia method" of Nussbaum the best and most reliable. It consists in giving the patient a Pravaz hypodermatic syringe full of a 2 per cent. sol. of morphine, and after twenty minutes narcotising with chloroform is begun. If one does this carefully the patients may be perfectly anæsthetised, but need not loose consciousness; they will feel all manipulations, hear and understand everything that is spoken, but

have no pain. "I always," says Woelfler, "have the impression as if the 'mixed chloroform-morphine-narcosis' were hypnotised; they lie with closed eyes, hear and answer, but do not feel any pain."

- 4. Billroth's Method for Extirpation of Goitre. "All procedures for extirpation of goitre which claim to be methods must fulfil the following requirements: first, the afferent arteries and efferent veins must be isolated and ligated in a regular and typical manner; second, the avoidance and preservation of the contiguous structures (large vessels, nerves, trachea and œsophagus) must be taken into consideration. Care is also to be taken that a part of the thyroid gland may remain." Billroth's method of extirpation is intra-capsular. W. describes now at length (15 pages) Billroth's method, which he already had described at the Congress of the German Surgeons in 1883 (cf. Transactions of this Congress;—Translator).
- 5. Comparison of Billroth's Method with that of Kocher. The differences are slight ones. Billroth's operation is intra-capsular and Kocher's extra-capsular. The results are excellent on both sides. Kocher's method requires greater experience and skill.
- 6. The Control of the Hemorrhage and the Interrupted Manner of Operation According to J. Wolff. The author does not improve on Wolff's advice to use compression instead of ligation to control the venous hemorrhage. The danger of the entrance of air and severe secondary hemorrhage is too great. The proposition to interrupt the operation and continue and finish it after a few days; i. e., to perform the operation for extirpation at two seances Woelfler would not entirely reject. However, a very few patients would like to go twice through the danger of narcosis and the operation; but the proposition may receive attention in the case of very old or feeble persons who could not bear a long continued anæsthesia or operation.
- 7. On the Technical Difficulties and Dangers during Typical and Unilateral or Incomplete Total Extirpation or those Arising Immediately Thereafter. Most of the difficulties and dangers called forth depend upon the degree of adhesion of the goitrous tumor with the surrounding important tissues and organs. The more movable the tumor is,

the less dangerous and easier is its removal. If the capsule should be found to be adherent to the hyoid bone, the important cervical vessels or nerves, the trachea, aorta, larynx, œsophagus and pleura, then the adherent strips of it should be cut off and left in place, i. e., adherent to these important structures, lest the attempt of breaking up these adhesions may result in serious injury to a number of vital structures and functions of the patient.

Among the dangers which may arise during or after extirpation of the goitre tumor, the author mentions the following: (a) Primary and secondary hemorrhage; (b) the entrance of air into veins during or immediately after the operation; (c) the severing of important nerves, the sympathetic, vagus and hypoglossus, inferior and superior laryngeal nerves, etc. W. also considers, at length, the consequences if any of the above mentioned important nerves have been injured and quotes copiously from the literature on this subject.

- 8. Treatment of the Wound. Complications arising immediately after the operation and during the course of the wound.—(a) No unique and definite method can be prescribed for the treatment of the wound after operation for goitre; it will depend on the views of the individual surgeon and peculiarities of the individual case. The author would recommend to leave in the wound as few ligatures as possible, and in order to avoid the latter to use the thermo-cautery freely. He calls attention to the necessary careful and antiseptic treatment of the retro-sternal spaces, which often form a nidus for the undisturbed development of pus, and contrary to the views of other surgeons recommends thorough drainage.
- (b) Complications of the course of the wound. Among these the author refers to: (a) Difficulties in swallowing, (b) disturbances of respiration, (c) pleuritis and mediastinitis. Some of these ought to be only of historic importance, if all the procedures are carried out carefully and thoroughly.
- (c) Cases of Death; (a) cases of death during the operation or a few hours later; (b) cases of death during the course of the wound; (c) cases of death which occurred a few months after the operation. The author analyzes under this head his cases of death regarding the

direct and indirect influence of the operation upon this unfavorable issue. He mentions here, also, the circumstance already referred to by the older physicians and recently by Prof. ALBERT (Vienna), that some people perish from tuberculosis after extirpation of the thyroid gland.

- (d) Tetanus; Woelfler quotes from Von Eiselberg (Vienna), who has written an excellent essay on this subject, that tetanus appears only in total extirpation. In a hundred and fifteen cases of partial extirpation not a single case of tetanus came under observation, whilst after fifty-three total extirpations tetanus was observed twelve times (in Billroth's clinic). Of the thirty cases of tetanus, after extirpation of goitre, reported in the entire literature twelve cases occurred, in Billroth's clinic,. The author now gives analytic tables on this subject and treats it in extenso.
- (e) Myxædema Operatium (Reverdin), Cachexia Thyreopriva (Kocher). Already Rush, Cooper and Hausleuthner mentioned that mental distubances appear after total extirpation of the thyroid gland. These views, however, received for a time no more consideration until lately, the subject was thoroughly studied by Kocher and the author himself. W. analyzes forty-six cases of total extirpation (performed in Billroth's clinic at Vienna), stating that not in all cases does myxcedema. operatium or cachexia thyreopriva make its appearance and comes to the following conclusion: "In nearly one-third of the cases there appeared soon after the operation or after months, even after four o five years' symptoms, which could have been avoided, if a piece of the goitre would have been left in the wound." He, also, again urges never to perform total extirpation. Woelfler then treats in extenso of the pathogenesis, symptomatology and nature of myxcedema and tetanus; drawing from the entire literature on this subject. A complete statistical table comprising the histories, results and sequelæ of thirty-nine cases is added to this chapter.

(To be concluded.)

INDEX OF SURGICAL PROGRESS.

GENERAL SURGERY.

Surgical Anæsthesia.—By Gurlt (Berlin). The writer gives a resumé of the administration of the various anæsthetics in one year in the various clinics of Germany and Switzerland. Out of 48,605 administrations there were 33 deaths. Ether has given but one case of death in 4,500 administrations. Nevertheless, this anæesthetic is but very little employed in Germany. Bruns, Stelzner, Iversen, and Julliard are well satisfied with this anæsthetic and continue to use it. The bromide of ethyl has been administered in 2,000 cases, being only employed in minor operations and in dental work. Cases of violent excitement have been observed but no mortal accidents. Finally, pental which has been given in but 226 cases has one death already on record.—La Semaine Médicale, No. 31, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio).

A New Method of Resuscitation in Death from Chloro-

form. By Maas (Göttingen, Germany). The writer, from his experience in the Surgical Clinic, at Göttingen, Germany, warmly recommends the following method of resuscitation of patients dying under the influence of chloroform: The operator stands on the left side of the patient, with his face toward the head of the patient and with rapid and strong pressure the cardiac region is pressed upon. The ball of the thumb of the right hand is laid upon the chest between the place of the apex beat and the left border of the sternum. The number of the shocks or compressions is about 120 per minute. With this rapidity of movement one must be careful that one exerts enough force and not be fearful of pressing too hard. The procedure will be found somewhat easier if one place the left hand upon the left side of the thorax and thus fix the body. Success is denoted by the artificially produced carotid pulse and contraction of the pupils.

The force and rapidity of the impulses must be controlled by these. In order to control the result some one should stand at the head of the patient and watch his pupils and the carotid pulse. As long as the condition of the patient does not improve the pauses should be as far between and as short as possible. Later, when the pupil contracts, one may wait until it begins to dilate or as long as the spontaneous respiratory movements continue. One requisite of success is a certain amount of elasticity of the thorax wall. This is found in most cases as the experience of the writer with old people has shown.—Berliner Klinische Wochenschrift, No. 12, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio).

Anæsthesia from Pental.—By Phillip (Berlin). The writer claims that pental has the advantage over chloroform of exerting no injurious influence upon the heart. The pulse always keeps regular and full. Another advantage is the absence of the ill-feeling on awakening. In children anæsthesia is obtained in at least one minute. In adults three or four minutes are requisite. Pental may also be employed in operations of the duration of an hour or more. In general the anæsthesia is obtained without any preliminary period of excitement. Only one patient has presented a slight degree of cyanosis, during the course of its administration. Finally, its inhalation is not disagreeable. Schede advises one to be reserved in the use of an anesthetic which has already, with its limited application given one death.—La Semaine Médicale, No. 31, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio).

Local Anæsthesia by Infiltration.—By Schleich (Berlin). The writer, from experiments upon himself and others, has sought to determine the weakest solution of cocaine that will produce local anæsthesia from intra-dermic injection of the drug. He has found that a solution, 1–5000 will produce sufficient local anesthesia. Finally, he experimented with distilled water and found that it would produce local anæsthesia, but its injection is painful. On the contrary, a 2 per cent. solution of the chloride of sodium will also produce anæsthesia without the inconvenience mentioned. Afterwards the

idea suggested itself to him to combine the two, cocaine and the chloride of sodium. From his experiments he has discovered that a combination of cocaine so dissolved in a 2 per cent. solution of the chloride of sodium as to produce a 1-10,000 solution of cocaine will produce a local anæsthesia that will give practical results. With weak solutions of cocaine the resultant local anesthesia is absolutely devoid of danger, and as one is thus enabled to inject a large quantity of the liquid a great extent of tissue may be anæsthetized. Therefore he would prefer this method and restrict the application of the anæsthetics generally employed on account of their dangerousness.—La Semaine Médicale, No. 31, 1892.

FRANK H. PRITCHARD (Norfolk, Ohio).

The Dangers of the use of Cocaine in the Surgical Treatment of Hydrocele. By Chobaut (Lyons, France). The writer reports a case of severe poisoning by cocaine after an injection of a solution containing 90 centigrams of cocaine in 30 c. c. of water into a hydrocele. It is known that the retention of fluids injected into hydroceles is anything but rare. Tillaux, Ollier and Terrillon mention it in their works and, although they recommend the employment of this method, Burdet's, they also enjoin great prudence. Berger recently reported a death from the use of cocaine. —Le Lyon Médical, No. 20, 1892.

FRANK H. PRITCHARD (Norwalk, Chio).

NERVOUS AND VASCULAR SYSTEMS.

A Case of Aneurism of the Descending Aorta Treated Successfully by Bacelli's Method. By Bourget (Lausanne-Switzerland). The writer had a patient under his care in the can, tonal hospital at Lausanne, suffering from pulmonary tuberculosis. This affection was greatly ameliorated by the administration of creosote, when the symptoms of an aneurism of the descending aorta developed. It had gradually worn away the body of a vertebra and one or two ribs, and seemed to enlarge in the space between the scapula and the spinal column. In order to bring about a coagulation of the

blood in the sac Bacelli's method was tried. January 16, 1892, a watch spring 2 mm. broad and 37 cms. long with a spiral five centimetres in diameter was chosen. The extremity was sharpened and it was placed into a boiling solution of hydrochloric acid in order to render it aseptic and more to cover it with a film of ferric chloride which is to be the point of departure of the coagulation in the sac. A small slit was made in the upper portion of the sac and while an assistant held the spiral unwound, the end was introduced through the wall of the sac and the entire spring was introduced with the greatest ease recoiling itself immediately. The slit was closed. The patient did not complain of any painful sensations, either during the operation or afterwards. The temperature remained 37 during the entire period of treatment. The tumor decreased in volume, the intercostal pains diminished in intensity together with those along the spinal column. A month after an exploratory puncture into the sac did not reveal blood in the sac, and the needle transmitted the impression of an elastic mass of some resistance. The pulsations are also decreased in extent and intensity. The patient has gained three and a half kilograms in weight. The writer thinks that this result will be still improved with time.—Annales de la Suisse Romanne, No. 5, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio).

Abscesses of the Medulla Oblongata. By EISENLOHR (Hamburg, Germany). The writer reports the two following cases: The first was that of a man, 43 years of age, in whom a purulent pleurisy called for an operation for empyema. After the operation the temperature did not fall, but paralysis of the arm and left leg set in, with anesthestia of the hand and forearm. This was succeeded by paresis of the right side. The facial nerve was not involved, neither were the hypoglossal nor the ocular nerves. At the necropsy an abscess of the medulla oblongata was discovered which had burst into the fourth ventricle and extended down as far as the root of the second cervical nerve.

The second case concerned a young man of 25 years, who was affected with cerebro-spinal meningitis, and who presented slight symptoms of physic disturbance, without paralysis, together with the

meningitic symptoms. At the necropsy an abscess was found in the depths of the medulla, in the neighborhood of the protuberance pons. Deutsche Medizinische Wochenschrift, No. 6, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio',

Two Cases of Removal of the Semilunar Ganglion through the Floor of the Skull for Facial Neuralgia. By EDMUND ANDREWS, M. D., LL. D. The first case was an old lady about sixty-two years of age, who had been suffering very violent facial neuralgia for a period of five or six years. So violent was the pain that she was unwilling to eat any solid food, and for a long time had confined herself to liquid nutrition because it could be swallowed with less pain. The deeper parts were uncovered by a plan similar to that adopted by Rose in his second case, which was as follows:

Having shaved the temple and disinfected the surface, a perpendicular incision was made across each end of the zygomatic arch and connected like the letter H with a cross incision running along the arch itself. The anterior and posterior extremities of the arch, were then sawed off separating the bone from the temporal fascia, and turned it downward and backward upon the jaw, carrying the masseter muscle with it. This uncovered some connective tissue and the temporal muscle. The coronoid process of the lower jaw was next sawed off, turned upward, carrying with it the attached temporal muscle against the side of the head. This uncovered a quantity of loose connective tissue lying inside of the temporal muscle in which runs the internal maxillary artery, which was ligated. Picking out and pressing aside the loose fat, the external pterygoid muscle was uncovered, which arises from the external pterygoid plate and adjacent part of the base of the skull, and runs horizontally backward to be inserted into the neck of the jaw. Dividing this muscle near its insertion, it was drawn upward, and the dental nerve found emerging from beneath it, and a little farther from it was the gustatory nerve. These two trunks were seized, cut off, and the stumps held in the grasp of a pair of forceps as a guide to the foramen ovale. At the same time the finger was passed along the posterior free border of the external pterygoid plate upward to the skull, where the foramen exists. Having identified its locality and suppressed the hemorrhage, which was pretty free, the plan at that time practised by Professor Rose was modified. Instead of introducing the centre-pin of the trephine into the foramen ovale, the muscular attachments were scraped from the level under-surface of the bone external to the foramen, there being at that place no important organs to be wounded. A five-eighths of an inch trephine was then placed on this level surface and took out a button of bone just external to the foramen ovale, then with bone-cutting instruments the septum of bone remaining between the trephine hole and the foramen was removed by a rongeur of his own devising as the ordinary rongeurs cannot be made to enter the opening properly. Rose used a mallet and bonechisel, which he avoided, fearing the jar inflicted upon the brain by the blows. The trephine hole and foramen ovale are thus thrown together into one large opening, giving room to work at the ganglion. Drawing the nerves strongly outward, an opening was made into the capsule by a semicircular incision on its inner side, and, drawing it still more strongly, enlarged the opening sufficiently to get in a small surgical spoon, which was quite sharp. Rose uses forceps and a little blunt hook and hooked knife to extract the ganglion. As the carotid artery runs pretty near the inner border of the ganglion, the convexity of the spoon was kept in that direction, but pushed cautiously until it was felt that it had reached the farther end of the capsule. With the edge upward and forward, the ganglion was scraped from its attachments to the superior walls of the capsule which separates it from the brain, and the destruction of the parts was completed by twirling the instrument in the capsule. A good deal of venous hemorrhage continued during the whole operation. The inferior maxillary nerve was cut off from the dura mater and taken away after the ganglion itself was scooped out. Next, the coronoid process with the attached temporal muscle was drawn down and wired in its place on the jaw with silver wire. The masseter flap was then turned upward and wired by the attached zygomatic arch to its location in a similar manner, closing the whole with sutures. The whole operation was done with the usual antiseptic precautions.

The patient, who had been bedridden for five months and was feeble, suffered some shock, but reacted well after some hours. After the first pain of the operation was over, she found herself entirely relieved and could swallow food without difficulty or suffering. The motor muscles of the eye were found to be paralyzed, as also was the levator palpebræ, showing that the instrument had injured the third and fourth pairs of nerves. This condition passed away, showing that the nerves were not completely destroyed. began to eat heartily, and rapidly regained her strength, and soon resumed the personal care of her household. It has been observed in experiments on animals that injury to the fifth pair of nerves is apt to be followed by ulceration of the cornea and loss of the eye. Probably this was due to the fact that the eye being destitute of sensation, the animal no longer protects it by winking and keeping it closed in sleep, so that it was dried by the air and irritated by dust and foreign bodies, and thus became ulcerated. The early experimenters attributed it to the loss of the neurotic control exerted by the nerve over the nutrition. Believing in my own mind that the cause lies in the neglect of the eye rather than in the loss of the ganglion, I requested the patient to keep the eye most of the time protected by a compress. But after the diminution of the visits of her physician the eye was perhaps less carefully protected, and after a time he found some ulcerations on the cornea. He directed a boracic acid wash and a reapplication of the compress, under which treatment the eye soon healed. It is now about five months since the operation was performed, and the patient is entirely free from pain.

The second case was very similar to the previous one, except that the pain had existed for some ten years, but she was not confined to bed. The pain was on the right side of the face as in the previous case, and the patient was a woman. It seems for some unknown reason to be true that the majority of these patients are women, and a great majority of attacks are upon the right side of the face and in the inferior maxillary nerve.—International Medical Mag., June, 1892.

SAMUEL LLOYD (New York).

CHEST AND ABDOMEN.

Adhesions and Omental Bands as the Cause of Violent and Long-Lasting Colics.—By LAUENSTEIN (Hamburg). The writer has operated on twelve patients who had suffered for a long time from violent colic. They had been under treatment but without No cause could be assigned, neither any inclination to biliary calculi nor floating kidney could be made out. An exploratory incision would clear up the case and reveal the presence of adhesions or bands joining the stomach or intestine to some other organ or the abdominal wall. Removal of these adhesions or bands would be followed by a complete disappearance of nearly all the symptoms in nearly all the cases. Only one patient died. In this case a man had suffered from the pain for a very long time, and at the operation adhesions were discovered between the stomach and transverse colon, between this latter and the descending colon. He died of collapse twenty-four hours after the operation. Hence, exploratory incisions should only be made after all other means of treatment have been tried in vain. These bands and adhesions are often due to an affection of the gall-bladder, stomach or tubes in women. In one case the writer found a band extending from the stomach to the umbilicus. The patient had suffered for thirteen years from pains which resembled those produced by fatty hernias of the epigastric region. Another interesting case was that of a woman forty years of age who had suffered for a long time from pains in the back and right side of the thorax. An operation revealed adhesions between the gall-bladder, the transverse colon and the duodenum. The gall-bladder also contained a number of gall-stones which were removed. The biliary fistula closed spontaneously. Further attacks of colic led him to reopen the gall-bladder and remove six calculi which were found incarcerated in the cystic canal. Loebker has operated on twenty cases of cholelithiasis and has found adhesions in six cases between the gall-bladder and the adjacent organs. Winiwarter, of Liege, has operated on three cases analogous to those described by Lauenstein. One of these has been operated on four times. A cyst of the ovary was removed which presented numerous adhesions. months after the patient returned and complained of severe colic.

Laparotomy revealed an adhesion between the ascending colon and abdominal wall. A few months after laparotomy was again done to remove new adhesions. Finally, a fourth laparotomy was required to obtain a definite and complete result.—La Semaine Medicale, No. 31, 1802.

FRANK H. PRITCHARD (Norwalk, Ohio).

Treatment of Suppurative Peritonitis. (Berlin). The writer in the space of two years has done laparotomy 19 times for suppurative peritonitis. Six of the patients recovered, but one of them still has a fistula. This result is the more satisfactory as the patients were not picked but operated on as they presented themselves, as grave peritonitis following perforation of the intestines. These cases do not include those cases due to gangrene of the intestine from hernia or internal strangulation. With regard to the prognosis a distinction must be made between acute peritonitis, septic peritonitis, without any notable exudate, and suppurating peritonitis with an abundant exudate which often have a tendency to become limited from the formation of adhesions. In the former laparotomy offers but little chance of success. On the contrary, operation will often cure the latter form. The surgeon should above all things evacuate the pus in order to prevent the reabsorption of septic matter. Besides evacuation of the exudate relieves the tension of the abdomen and ameliorates the subjective symptoms. This is even obtained in unsuccessful cases, and should be taken into consideration in the treatment of grave cases. Out of these 19 cases 12 were found to be purulent and these are the ones which gave him the six cases of recovery. The sooner the operation is done the better the chances of recovery. Among 5 cases operated within twenty-four hours 3 recovered. Those operated on the third day of the disease, all perished. Irrigation of the peritoneum the writer considers not harmful but useless. Adhesions in the process of formation should be respected and left alone. It is also necessary to give large doses of opium to the patients after the operation. Drainage is indicated. Sometimes several incisions are necessary. The wounds should be left open. If the perforation is from the stomach it should be sought for. But if the intestine or vermiform appendix is perforated it is better not to attempt to find it but to be satisfied with the incision and not waste time in seeking for the point of perforation, as the patients are in general too weak to bear a prolonged surgical operation. Sometimes a stercoral fistula may form, yet this will frequently close spontaneously.—La Semaine Médicale, No. 31, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio).

Dilatation of the Gall Bladder Accompanying an Hydated Cyst of the Liver. Opening of both cavities; drainage, cure. By M. TERILLON. 1 Eight months before applying to M. Terillon, a young man 19 years of age had had an hydatid cyst of the liver aspirated, and had remained free from trouble for 8 months. On admission to the hospital he complained of pain in the region of the liver and for several weeks he had noticed an increase in the size of this region. He was somewhat icteric. He had never had hepatic colic. In examining the region of the liver the whole of the right lobe was found to be enlarged, but above the right side to the side of the median line a rounded tumor existed which extended down to the umbilicus. This tumor was lengthened out vertically, was attached to the parietal walls and was distinctly fluctuating. As this pouch corresponded to the region of the gall bladder, and as it had the elongated form which this organ would give when filled with liquid, in order to determine whether this was a recurrence of the hydatid cyst it was punctured and about a litre of dark-colored liquid was withdrawn which did not contain any hooklets. The chemical examination proved it to be biliary fluid, and consequently simple dilatation of the gall bladder was diagnosed. Some days later, the pouch having filled up, it was opened (February 28, '89), a lateral incision corresponding to the middle of the tumor was made down to the walls of the gall bladder. A puncture into this viscus gave 800 grammes of a decidedly green-colored liquid. After this evacuation the gall bladder was opened; the walls were thickened, the mucosa hypertrophied, but neither calculus nor special alteration of its interior could be made out. The cystic canal was explored carefully for 5 centimeters, and at this point it was obliterated; no instrument could pass this limit. An attempt was made to strip off the walls of the vesicle and

¹Bull. Gen. de Therapeutique, June, 1892.

detach them from the abdominal walls, but it was useless; the adhesions were too firm, so the viscus was fixed to the abdominal wound by a great number of sutures.

The results of the operation and the fistula thus established gave a certain amount of mucus stained with bile, when, on the 15th day, there suddenly escaped through the orifice a very abundant quantity of bile. This phenomenon occurred three times in the course of a month. It lasted three days. At the end of a month the general condition was excellent, when, on the second of April, the temperature rose to 40°, with some nausea, some cephalalgia and rapid pulse. These inexplicable symptoms continued eight days. When suddenly there escaped from the fistula a large number of feetid and mortifying hydatid vesicles. The liquid contained some echinococci. The temperature rapidly fell. During the next five days there were several litres of these altered hydatids escaped. Soon the fistula no longer gave exit to hydatids or bile and was completely cured at the end of some weeks.

Six months after the operation the patient left the hospital cured. Three years later no lesion of the liver could be made out. He complained only of a tugging at the level of the cicatrix which caused him to hold himself slightly bent forward.

The cicatrix was keloidal and slightly painful. In this case it seems very evident that the dilatation of the gall bladder was due to the presence of an hydatid cyst which occupied the inferior surface of the liver and compressed the ductus communis choledochus. This cyst ruptured spontaneously into the passsage of the gall bladder six weeks after this had been opened after having undergone an inflammation which had lasted from five to six days.

SAMUEL LLOYD.

A Case of Hysterectomy in a Child. By Dr. E. H. Bradford. The patient was a child having a tumor in the lower portion of the abdomen, which grew rapidly in the three months previous to the time when the child entered the hospital. As there had been a rapid increase in the size of the tumor, an operation was thought advisable. On palpation, a large mass could be felt in the lower portion of the abdomen, a short distance—an inch and a half—below the umbilicus,

and filling the lower portion of the abdominal cavity. The tumor was movable and irregular in shape. It appeared to be attached, in the middle line, to the lower part of the pelvis. An abdominal incision was made, and a firm, resistant tumor was found occupying the middle line of the body, and without adhesions to the intestine or to the abdominal wall, except at the base. In order to remove the tumor, it was found necessary to free the attachments of both broad ligaments and to enlarge the incision above the umbilicus and to take the mass of the tumor out of the abdominal cavity. The tumor was friable, and some bleeding occurred from the unavoidable tearing of the external surface. This was controlled by the application of a rubber-tube around the base of the tumor. Hysterectomy pins were inserted at the base, and the ecraseur applied. The tumor was pressed upward by pressure in the vagina as well as by pulling it upward by means of hooks, and in this way it was possible to place the wire of the ecraseur around the neck of the uterus below the mass. The tumor was then cut off above the point of insertion of the needles, and the stump seared by the Paquelin cautery. The abdominal incision was sewed up, with the stump outside of the abdominal cavity. The patient suffered from some shock. The pulse was rapid and remained rapid for nearly a week. There was no elevation of temperature beyond the two days following the operation. The case progressed rapidly and uninterruptedly to recovery. The slough came away after a fortnight, and the wound healed entirely at the end of two months. The patient was discharged from the hospital six months after entrance. There is no evidence of recurrence at present.

On microscopical examinations the tumor was found to be a growth of the ovary, which had invaded and surrounded the substance of the uterus so completely as to form one mass, it being impossible to distinguish without microscopical examination where the abnormal tissue ended and the normal uterine tissue began. On careful examination, it was found that the whole of the growth had been removed, and that the base consisted of normal uterine tissue. The rapid cellular development had prevented any cystic formation in the growth, so that the tumor was entirely solid. It is too early to form an opinion as to

probability of recurrence.—Boston Medical and Surgical Journal, June 2d, 1892.

Samuel Lloyd (New York).

EXTREMITIES.

Senile Gangrene of the Toes; Amputation at the lower third of the Thigh; Recovery. By M. S. Kakeles, M. D. (New York). On examining the patient, one would, from her appearance, have judged her to be ninety years old instead of seventy. Anæmic, haggard, and in a debilitated condition. The urine, from repeated examination, contained neither sugar, albumin, nor casts. Over the sacrum there was an abrasion of epidermis and cutis about the size of the palm of the hand, as result of continual pressure.

The left big toe was entirely gangrenous, the second in an incipient stage of mummification. From her general appearance and debilitated condition, and from the character of the gangrene, there seemed at the time no hurry to amputate the foot, or even the toes, until the nature of the progress of the disease was well established and the patient had been put in a better condition, although it was thought that an amputation above the middle of the leg would give better results than removal of the toes or even the foot.

The gangrenous toes were treated antiseptically, and the course of the disease carefully watched until it commenced to spread to the back of the foot.

The cause of the gangrene was attributed to thrombus in the capillaries, and, on account of the unhealthy condition of skin above the ankle, due to a chronic ulcer, and as the popliteal artery was also much sclerosed, it was decided, after careful deliberation, that the prognosis would be far better by amputation above the knee than below, through a skin which in all likelihood, from its appearance, would have sloughed, and thus endangered the patient's life through septic infection.

On April 2d, as careful an aseptic operation (under a narcosis with the A. C. E. mixture) as could possibly have been done was performed through the junction of the middle and lower thirds of the femur. The circular method was used; the flaps sewed with silkworm

gut, and three small drainage-tubes inserted—one at each end, and one in the middle of the wound. The stump dressed, and patient put to bed with a good pulse. She rallied well and primary union obtained, except where the drainage-tubes were inserted. After four weeks the patient was walking around on crutches, and said she felt better than she had in the last twelve years. She left the city perfectly happy that she could once more walk about.—N. Y. Med. Jour., May 21, 1892.

ULCERS, ABSCESSES AND TUMORS.

Sarcoma of the Femur and Complicated Fracture. By SEYDEL (Munich). The writer presented a specimen to the twenty-first meeting of the Congress of German Surgeons which consisted of a voluminous sarcoma of the femur which had developed in a subject who had been shot in the thigh by a chassepot bullet, in the Franco-Prussian war. The ball had produced a complicated fracture of the bone which had healed, leaving a fistula which had persisted up to the last. After some twenty years the sarcoma began to develop. Amputation of the thigh did not save the patient, as he succumbed to the metastasis three months after the operation. The projectile had remained in the femur as was shown in making a section.—La Semaine Médicale, No. 31, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio).

Sarcoma of the Femur, without Recurrence Five Years after Amputation through the Trochanter Minor. Dr. Frank Hartley has reported a case of a man, twenty years of age, who was admitted into Roosevelt Hospital, on October 9, 1886. The history showed disease in the knee joint for eight months. The diagnosis was that of sarcoma of the lower end of the femur, involving the knee joint. The patient was markedly anæmic. The thigh was amputated through the trochanter minor, and the patient was discharged, cured, November 29, 1886. There had been no recurrence of the disease. This fact was important because Borck, of Rostock, had collected a hundred and twenty cases of exarticulation at the hip joint for malignant growths, of which he found that in only

eighty-seven had the patients recovered from the operation. Of the remaining patients, twenty-six had died from metastases—twenty in the first year, two in the second, one in the third, one in the fifth, and in two the time had not been determined. In six cases death had occurred in from twenty days to fourteen months after the operation, from disease unconnected with the original trouble. Four cases existed in which the patients had lived more than ten months, as follows: One lived twenty-seven months without metastases (Madelung); one lived two years and a half with metastases upon the back and beneath the arm, connected with the ribs (Czerny); one lived three years without metastases (Kūster); and one lived thirteen years with a suspicious tumor in the arm. We did not cure these cases by disarticulation. Twenty-four of the twenty-six patients had had internal metastases, and two had had local recurrence.

The case now reported suggested the question of whether amputation at the trochanter minor, except in cases involving the bone near it, was not a less severe method of treatment than exarticulation, and one likely to be followed by equally good results.—N. Y. Med. Jour., June 4, 1892.

BONES.-JOINTS.-ORTHOPÆDIC.

Results in Cases of Hip-Joint Disease Treated by the Portable Traction Splint without Immobilization, except during the Inflammatory Stage of the Disease. By Lewis A. Sayre, M. D. In the last few years so many papers have been published on hip-joint disease, advocating absolute *immobilization* of the joint during the entire treatment of the case, and in many cases without traction, and some of them condemning the portable traction splint, which had yielded such excellent results in his hands, as well as in those of many others who have used it properly, that he had looked over his note-books and ascertained the results in the various cases of which he has record.

In some cases the recovery has been so perfect and complete, in reference to both form and motion, that the question has been raised whether the patients had ever been troubled with hip disease. It is on this account that only such cases were selected to report as had been examined by other surgeons of the highest standing, and whose knowledge and ability to make a correct diagnosis would certainly be unquestioned in the professional world.

Patients who have been perfectly cured of hip-joint disease should be able to flex the thigh to an acute angle, and cross the foot over the thigh of the opposite side. This last motion is very difficult to accomplish if there is the least rigidity about the hip-joint. Most patients having recovered from hip disease, even with quite good motion of the joint and with but a very slight limp, yet can not cross the foot to the opposite side to tie their shoes, but always put their foot to the side and behind them in order to get at their foot. This test is therefore looked upon as the best proof of perfect motion in the joint.

Statistics of 407 Cases of Morbus Coxarius treated between 1859 and 1889, exclusive of Exsections.—Of these were in the first stage, 118; second stage, 119; third stage, 82; not mentioned, 88; total number of cases, 407.

Results.—Cured, motion perfect, 71; good, 142; limited, 83; ankylosed, 5; unknown, 78; under treatment, 14, abandoned treatment, 3; discharged, 2; died of exhaustion, 2; phthisis, 1; pneumonia, 1; tubercular meningitis, 5; total deaths, 9; total number of cases, 407.

Cases in which are known, the Result and the Kind of Splint worn between 1859 and 1889 excluding Cases under Treatment.—Cures with perfect motion: long splint, 19 = 21.59 per cent.; short splint, 54 = 28.12 per cent.; number of cases, 73. Cures with good motion: long splint, 34 = 38.63 per cent.; short splint, 86 = 44.79 per cent.; number of cases, 120. Cures with limited motion: long splint, 29 = 32.95 per cent.; short splint, 49 = 25.52 per cent.; number of cases, 78. Cures with ankylosis: long splint, 3 = 3.40 per cent.; short splint, 1 = 0.52 per cent.; number of cases, 4. Deaths: long splint, 3 = 1.56 per cent.; short splint, 2 = 1.04 per cent.; number of cases, 5. Treated with long splint, 88; short splint, 192; total number of cases, 280.

He had had no personal experience in the treatment of hip disease by perfect immobilization, but had to exsect in one case in which the joint had been *immobilized* by a plaster-of-Paris cast from axilla to foot for *two* years. The first cast being applied in the very early stage of the disease, the limb was retained perfectly straight by the plaster casting; but as *no traction* was used, the reflex muscular action caused constant pressure of the head of the femur against the acetabulum, causing absorption of the head of the femur and perforation of the acetabulum. An abscess forming inside of the pelvis peeled off the periosteum and opened above Poupart's ligament. As there was not the usual deformity of hip disease, and no pain on upward pressure of the limb, the surgeons in attendance did not recognize it as hip disease, and Dr. Sayre was called in consultation. He gave it as his opinion that the joint was already destroyed, and that *exsection* was the only chance for saving the child's life.

The operation was a success, and, eight months after, the boy was riding on horseback in the mountains of Virginia. He went back to Texas, and two years after was attacked with nephritis and died from suppuration of the kidney.

In 1859, he was requested to go to Frankfort, Ky., to see a young lad suffering from hip disease of three years' standing. He sent Dr. Baur, then of Brooklyn, to go in his place. The doctor divided the contracted muscles, straightened the limb under chloroform, and placed the boy in the wire breeches, which made him perfectly comfortable. In fact, he was so comfortable that Dr. Rodman, his attending physician, was afraid to remove him from the wire breeches, fearing that he would not again be able to replace him as comfortably as he then was.

He was carried down on the Kentucky river every day for a row, and was perfectly free from pain from the time that Dr. Baur placed him in the cuirass. He was not removed from the wire breeches for nine months, and when he was taken out the disease was perfectly cured, but the joint completely ankylosed, as were also the hip of the opposite side, both knees, and both ankles, as well as the entire lower portion of the spine. In fact, he could only move his arms and neck. He remained in this solidified condition till his death some years later.

In 1872 a girl was brought from Hamilton Junction, New Jersey, with double hip disease of eighteen months' standing. The

right, third stage; the left, probably the same. After gradually straightening the limbs, she was placed in the wire cuirass.

The limbs were removed from the cuirass occasionally, and slight motion was given to all the joints, while the limb was kept extended by traction with the hand.

Her general health improved greatly, and in six months she returned home in the cuirass, the mother having been carefully instructed as to the manipulation and dressing of the limbs. A letter from the mother was received in the latter part of 1873, saying that "she had entirely recovered, with good motion of both legs and no deformity."

Four years later, in March, 1877, the father said that "Mary was entirely well and very stout, but that the joints were stiff," as he had found it too much trouble to take her out of the splint so often, but that he was perfectly delighted and satisfied with the result. Had the limbs been occasionally removed from the cuirass and the joints slightly moved short of the amount that caused pain, this ankylosis would not have taken place.—N. Y. Med. Jour., April 30, 1892.

Fracture of the Temporal Bone involving the Petrous Portion; Extradural and Subdural Hemorrhage; Fistulous Communication with the Lateral Ventricle; Operation; Recovery. By Dr. C. K. Briddon. Man, aged twenty-six, had been admitted into the Presbyterian Hospital in his service, having fallen from a hay-loft, a distance of twelve feet, alighting on his head. It was thought that at the same time he had been struck on the head with a heavy piece of iron. On his admission his temperature was 100.5° F.; his pulse 80, full and regular; and his respiration 34. He was in a condition of stupor, but could be aroused, and was irritable. The pupils were equal, but dilated. There was a sero-sanguinolent discharge from the right ear. Examination of the scalp revealed a superficial contused wound in the right post-parietal region, but no evidence of depression. There was no paralysis. The reflexes were preserved. The head was shaved and an ice-cap applied. On the following day the temperature was normal, the serous flow from the ear continued profuse, and the mental condition was sluggish. There

were noted dilatation of the left pupil, deviation of the tongue to the left, obliteration of the right naso-labial fold, left conjugate deviation of the optic axes, and marked weakness of the left arm. The mental condition improved somewhat, but the memory was impaired, and the flow from the ear persisted up to the morning of September 7th, when he complained of a severe pain in the right side of the head and neck. and had become stupid. Thus, after a lucid interval of eight days, there supervened manifestations of compression, the patient lying as if in a tranquil sleep, except during paroxysms of delirium, lasting sometimes an hour, and followed by excruciating pain in the head. The pulse was slow and regular, except on exertion, when it would reach 130. When aroused, he would open his eyes and mutter. respirations were slow and deep, sometimes stertorous. The left facial paralysis, the inequality of the pupils, the optic deviation, the partial paralysis of the left arm, and the progressively increasing stupor, with a temperature of 105°, all seemed to justify an immediate operation. On September 7th he was operated on under ether narcosis and with antiseptic precautions. By a curved incision the squamous portion of the right temporal bone was exposed. There was found a V-shaped fracture, the apex pointing downward, and the arms extending upward to the squamo-parietal suture; the apex was depressed about an eighth of an inch. This was elevated and removed, exposing a clot. The opening was enlarged to the extent of an inch and a half and the clot removed. Examination showed a fissure extending downward through the root of the zygoma into the petrous portion, but it could not be followed farther. The dura was opened and the brain substance found lacerated and contused. Several small clots and a good deal of broken-down brain material escaped. There was a considerable protrusion of cerebral substance through the opening. Two drainagetubes were introduced, and the wound was dressed open. On the following day the patient responded intelligently to questions, but was delirious at times. The tubes were removed at the end of ten days. There was a protrusion of brain substance. Facial paralysis was still present, and there was complete deafness of the right ear. There was a continuous flow of cerebro-spinal fluid, the pillow being constantly soaked, and the liquid to be seen distilling from a small fistulous

opening, situated in the centre of the granulations covering the exposed brain. The amount that escaped every day was estimated at about two ounces and a half. On October 8th an aluminium probe was allowed to pass by its own weight into the sinus, a distance of two inches and a half, evidently entering the ventricle. The fluid was quite limpid and, after continuing for about two weeks, the flow gradually diminished, and in three weeks had ceased entirely. Pari passu with these changes the brain receded and cicatrization ensued. At the present time the wound was entirely healed, but the cicatrix was tender, and pulsation of brain could be detected over the area of the operation. No paralytic conditions remained except some obliterations of the naso-labial fold. One feature of extreme interest remained unexplained. Before this accident the patient had been the terror of the neighborhood in which he lived, frequently coming in contact with the police. Since his recovery his character had entirely changed; he had lost all his aggressive traits, or they were in abeyance, he was amiable and, as a convalescent, occupied himself in ministering to the other patients in the ward .- New York Medical Journal, May 21, 1892.

Incomplete Luxations of the Shoulder Joint. By HART-MANN AND BROCA (Paris). Two opposing opinions are given in the works of medicine, with regard to the incomplete luxations of the the shoulder joint, that of Panas and that of Malgaigne. The former doubts the existence of sub-locations, while Malgaigne in his treatise on fractures and dislocations gives the signs of incomplete dislocation of the humerus in the living subject and the results of the necropsy in a case four days after death. The dislocated head of the humerus was found in the uninjured capsule. The writers have had an opportunity to examine the anatomical relations in two cases of incomplete dislocation of the head of the humerus which were followed by death. The results of the necropsies seem to throw light on this disputed question. In both cases the capsule was untorn, the anterior and lower borders of the glenoid cavity was fractured, the periosteum torn from the bone and the head of the humerus jammed in between the denuded bone and the periosteum. In short, there was a complete

dislocation, with slight separation of the articular ends of the bones and an uninjured capsule. In one case the head was within and in the other it was outside of the coracoid process. On examination of the International literature the writers have found seven other cases, in which similar anatomical relations could be expected. After a critical examination of the former views which are current upon this question the writers conclude as follows:

- 1. Literature contains no case of proven incomplete dislocation of the shoulder joint.
- 2. Those injuries which are incorrectly termed "incomplete dislocations of the shoulder joint" are but sprains, with slight dislocation of the articular extremities of the bones.
- 3. Dislocation of the head of the humerus in an apparently uninjured capsule is explained by the separation of the periosteum.
- 4. The separation of the periosteum seemingly only is met with in those cases which are produced by direct force. They are not observed in typical shoulder luxations which are dependent upon forced movements of the articulation.

The writers also consider the osseous formations which occur in ancient dislocations of the shoulder joint and recurrent dislocation of the same articulation. They are of the opinion that the form in which the capsule is not torn and where the periosteum is elevated from the bone are easily predisposed to recurrence of the luxation if the periosteum does not heal at once onto the bone.—Bulletin De La Société Anatomique De Paris, Series 5, Vol. IV.

FRANK H. PRITCHARD (Norwalk, Ohio).

Temporary Resection of the Vertebræ. By Urban (Leipsic). The writer has sought to relieve compression in those cases of paraplegia from compression of the spinal cord following fractures of the vertebræ, or a spondylitis by means of temporary resection of the vertebræ. An incision is made on both sides of the spinous processes running vertically down to the transverse processes. Then a certain number of the laminæ of the vertebræ are cut through and left adherent to the soft parts. Thus a large rectangular flap is formed which gives free access to the vertebral canal. The cause of

the compression being relieved the flap is replaced and sutured. The writer has practiced this operation several times with successful results. He cites the case of a young man who in consequence of a fall had suffered for six months from complete paraplegia. Six weeks after the operation this patient commenced to get up and about and the paralysis disappeared little by little. In a young woman who was completely paralysed in the lower extremities from a fracture of the lumbar spine, twenty-four hours after the operation the author remarked a slight return of the sensibility in the paralyzed extremities. The operation has also been done with success in two cases of spondylitis, the projecting part being resected.—La Semaine Médicale, No. 31, 1802.

FRANK H. PRITCHARD (Norwalk, Ohio).

Hemorrhage in the Course of Hip Disease. By GEORGE HEATON, F.R.C.S. November 28th, 1890. Mr. Jolly excised the head of the femur in a lad twelve years of age. Acetabulum carious, and all carious bone and tubercular tissue removed, together with head. In February convalescent was sent to Jaffray Hospital. He gradually developed abscesses with fistulæ all about region of hip until in July, blood was discovered oozing from a sinus on inner side of femoral vessels. Patient had previously been straining at stool. Femoral vessels found traverse the walls of the inner sinus forming its roof. The exact point from which the blood came could not be discovered, and as, in spite of pressure blood contained to well up, and the patient's condition was becoming critical, it was decided to ligature the external iliac artery. After ligation a small drainage-tube was left in the lower angle of the wound. In August amputation of hip-joint done by Mr. Jolly, but patient died from shock. At the post-mortem the ligature was found firmly occluding the external iliac artery, which was filled from its origin to the point where it gives off the cervic reflex iliac and deep epigastric arteries, with a firm adherent clot. The hemorrhage came from an ulcerated opening into the internal circumflex artery, which was sealed up by a firm adherent clot.—Birmingham Med. Review, June, 1892.

SAMUEL LLOYD (New York).

REVIEWS OF BOOKS.

DISEASES OF THE NERVOUS SYSTEM. By JEROME K. BANDREY, M. D., LL.D. [St. Louis]. J. B. Lippincott & Co., Phila., 1892.

Were this the first edition of a work purporting to treat of modern neurology, one might well be at a loss whether to take it seriously. But as it was first published in 1876, even though now "entirely rewritten," nothing remains but to assume that this semblance of erudition is put forth in earnest. Niemeyer, Schraeder, van der Volk, Aitken, Elam, and other antiques, even though of distinguished memory, do not represent the authorities from which a general work in this field can properly make extensive quotations.

Nearly a quarter of the volume is devoted to the subject of anæmia and hyperæmia of the brain; feebly suggesting Hammond's well-known lucubrations on this matter. Next follows eighty-one pages on the various forms of meningitis. This, with four pages on meningeal hemorrhage, completes the subject of brain disease proper so far as this volume is concerned. The remainder of the book—about one-half—is devoted to insanity, especially in its medico-legal relations. To this part may be accorded the doubtful praise that it also is essentially a compilation.

Ergot and buckthorn are his most frequent resorts therapeutically both in brain and mental disease.

There are no illustrations, but the paper and printing are excellent.

A second volume is promised to "discuss diseases of the brain and spinal cord, and functional and peripheral diseases of the nervous system."

WILLIAM BROWNING.

ANLEITUNG ZUR ASEPTISCHEN WUNDBEHANDLUNG. VON DR. C. SCHIMMELBUSCH, Assistent Arzt der K. Chirurgischen Universitatsklinik des Geh.-Rath v. Bergmann in Berlin. 12mo, 199 pp. Berlin, Hirschwald, 1892. (Introduction to the Antiseptic Treatment of Wounds. By C. Schimmelbusch.)

This little manual is the outcome of the exhibit made during the last International Congress at the University Clinic in Berlin. Such widespread interest in the means and methods resorted to by Bergmann and his assistants was manifested that an elaborate description, with a running commentary, was prepared by its author in response to a general request. As it is now presented to us we have not merely a stilted or formal description of instruments, but an epitome of the reasons why the aseptic era has supplanted the antiseptic age and such terse and excellent rules for carrying out its principles that there is no excuse for anyone who may fall short of its realization.

After showing that absolute asepsis nearly does away with the bugbear of age and diathetic conditions as favoring infection, and a brief tribute to Joseph Lister, he proceeds to show, when speaking of air and contact infection, that it is not now so much the air that we distrust as organic material of the soil, etc., that germs only float when dry, and that these only do harm when they settle upon moist soil, and that the atmospheric germs are rarely pathogenic.

Next is set forth that wound infection is first local, and that sufficient protection ensures safety. Such protection is afforded, at one time, or another p. r. n., by one or more of the following; mechanical measures for removal (soap, brushes, etc.), germicides, antidotes to bacterial poisons, sterilization of everything that comes in contact with the parts, and such fortification of the system as tonics, and stimulants may afford. A very complete summary of germicidal substances and methods is added to this chapter. Then follow rules for caring for the patient, preparing the part to be operated on, cleansing the hands, the instruments (boiling in a soda solution being most highly commended for this purpose), sterilization of the dressings, for which live steam appears to answer best, and of the sponges or their substitutes, suture and ligature material, and selection of

drains and ensuring their efficiency. A short chapter details the precautions to be observed in injection and punction, and we are reminded that tuberculosis has been inoculated at least twice as the result of carelessness in this regard. Another chapter gives instructions as to the aseptic preservation and use of catheters and bougies. Then follow remarks on water from ordinary sources, the safety with which it may be used in surgery, its proper sterilization, directions for the preparation of the operating room either in a hospital or in a private residence, directions for dressing wounds, and when and how to change the dressings, with, lastly, some hints on treating emergency cases upon the same safe general principles.

All in all the manual is an excellent one and deserves translation, for it should be in the hands of every one who does any surgery. It is illustrated with a number of designs of apparatus intended mainly for sterilization, for which American ingenuity could easily substitute better and cheaper forms. Indeed, let an American practitioner but once realize the necessity for exactitude and plenitude of such precaution and he can find in almost any home some means for doing what is necessary; can at least provide it for himself. In other words once the object is fully appreciated the means may be in some measure adapted to the surroundings. Nevertheless every institution should be fully provided with some such apparatus as Schimmelbusch has described.

ROSWELL PARK.

TREATISE ON MEDICAL AND SURGICAL GYNÆCOLOGY. By S. POZZI, M. D., Paris. Complete in Two Volumes. Translated from the French edition under the supervision of, and with additions by Brooks H. Wells, M. D. Volume II. Royal octavo. William Wood & Co., 1892.

Volume II. treats of the diseases of the uterine adnexa; genital tuberculosis; intra and extra peritoneal pelvic hæmatocele; extra uterine pregnancy; diseases of the vagina and vulva; malformations of the genital organs, and diseases of the urinary tract and diseases of the rectum and pelvis by Anvord.

Salpingitis is divided into cystic and non-cystic forms according to whether they terminate or not in an encysted tumor, this with the subdivisions make a most complete and comprehensive classification. The term tubo-ovoretic or iophoro-salpingitis are used interchangably with ovoritis or salpingitis, as one is believed not to exist without the other at some time, and inflammatory conditions of the uterus are considered the chief causes of inflammatory diseases of the appendages, it being conveyed by means of the continuity of the mucous tissues; and if a catarrhal endometritis exist for any length of time the tubes will always be effected. The causes are classified under gonorrhoal, puerperal, infection and contamination from manual or instrumental In the treatment of the non-cystic variety a very commendable conservative plan is outlined, and exploratory laparotomy never being done for simple persistant pain in the region of the tubes, and in all cases of non-purulent inflammation a course of at least six months should proceed an abdominal section. The removal of both the tube and ovary is insisted upon, even if the ovary is not affected. The work of Polk and Mundé of treating the tubes by operation, but without removal in suitable cases, is commended. The removal of the appendages being reserved for 1st ovoritis and salpingitis where there is reason to suspect the presence of pus, and 2d, painful scelero-cystic ovoritis, and 3d, chronic parenchymatous salpingitis when in spite of the lesions apparently being slight, grave symptoms are a sequence.

In chapter III. devoted to cystic oophoro-salpingitis naturally chief attention is given to pyosalpinx, but the symptoms of hydrosalpinx and hæmato-salpinx are detailed together, the clinical picture of all being so similar.

The sudden discharge of pus from the uterus at irregular intervals, the author thinks, has been given too much importance as a means of diagnosis of pyo-salpinx, the discharge often coming from the cavity of the uterus from co-existing disease in the mucous membrane. The differential diagnosis being made largely from the history of the case as to whether it is gonorrheal in origin and whether it is bilateral or unilateral. The diagnosis from tubal pregnancy in the first stages is considered almost impossible to make with

certainty, the only diagnostic symptoms being enlargement of the uterus with discharge of decidual membrane. As soon as a diagnosis of a cyst of the tube is established, no treatment is advised, but removal at once, or as soon as the patient is thought to be in as favorable a condition as possible for an operation. The removal of the second ovary is not advised unless it is diseased.

In chapter IV. the term perimetro-salpingitis is used to cover the conditions formerly known as parametritis, perimetritis, pelvic inflammation, etc., etc.

The author very strongly endorses the ætiological theory of Aran, believing that nearly all these inflammatory conditions are some form of tubal disease having their starting point in a diseased uterine mucosa. Four varieties are described: First, serous perimetro-salpingitis; second, pelvic abscess; third, phlegmon of the broad ligament, and fourth, diffuse pelvic cellulitis. The term pelvic abscess is reserved for collections of pus that cannot be enucleated, starting in a septic lymphangitis from a uterine wound, continuing to a general inflammation of the cellular tissue (pelvic cellulitis), which may resolve or which may go on to suppuration (pelvic abscess).

The treatment for perimetro-salpingitis is largely the same as for salpingitis, or in other words, remove the cause.

In pelvic abscess and abscess of the broad ligament prolonged hot douches with rest in bed, and as soon as pus forms evacuate it in all cases, the channel depending on each individual case, the rectum being avoided if possible, perineotomy being preferred if necessary. In case laparotomy is done the abscess cavity is always aspirated and if possible the neck drawn up and stitched to the abdominal wound.

Chapter V., Pathological Anatomy of Ovarian Cysts.—From the clinical standpoint they are divided into solid and cystic tumors. Cysts are divided into large and small, and under the former proligerous or glandular proliferous; dermoid, simple or mixed and parovarian of several varieties, and under the latter small residual cysts, follicular, and cysts of the corpus luteum.

The different pathological views are discussed at length, but the author concludes that in the case of papillary and glandular cysts they take their origin in the *germinating* epithelium, but dare not attempt

to justify this conclusion. The impaction theory for the formation of dermoid cysts is considered the most satisfactory, though not entirely so "according to this view, during intra-uterine existence certain portions of the blastoderm become impacted by pressure within the tissue and develop them later, giving rise to an irregular formation of the normal tissues."

Chapter VI., Aetiology, Symptoms, Course and Diagnosis of Ovarian Cysts.—The physical signs are divided into two classes: first, a pelvic stage, and second, an abdominal stage. The diagnosis and prognosis are carefully considered, especial attention being given to the diagnosis. The author looks upon an exploratory incision as a safer as well as a more satisfactory means of diagnosis and advises it in all cases of doubt as a rule.

Under treatment of ovarian cysts the author starts out with the statement in the first paragraph that "every ovarian cyst, should, if possible, be removed," and follows with the palliative means when removal is impossible, as puncture through the abdomenal wall; injection of iodine and drainage after puncture or incision.

The consideration of ovariotomy commences with a short historical sketch of the operation and follows with a very clear and concise discription of the different steps of the operation complicated only by adhesions. The operation is divided into four stages; first, abdominal incision; second, rupture of adhesions; third, extraction of the cyst and ligation of the pedicle; fourth, the toilet of the peritoneum and closure of the abdomen. The author in all cases uses compresses of gauze instead of sponges. Necessarily there is not much new under the technique of the operation, under treatment the statement is made that the catheter should be passed every three hours for at least two days; some food and cracked ice is allowed the first twenty-four hours; the use of opium is condemmed and for prognosis the pulse is depended on rather than the temperature.

A careful account of the after effects of ovariotomy is given, especial mention being made of insanity and melancholia.

If a cyst is complicated by pregnancy, the author strongly advises its removal if possible before the fifth month of gestation.

In chapter VIII, are considered the solid tumors of the ovary, fibroma, sarcoma and epithelioma and carcinoma, all of which are rare and the differential diagnosis hard to make, exploratory incision and removal if possible is the only course to follow.

Under the consideration of genital and peritoneal tuberculosis the fallopian tubes are given as the usual starting point and from them the disease is transmitted to the ovaries and peritoneum. As to when the tubercle bacillus gains entrance to the female genitals, the author states that it can undoubtedly occur from cohabitation with a person suffering from genital tuberculosis, through the semen, but gives no positive opinion as to how it occurs when pulmonary tuberculosis exists. Secondary tuberculosis of the genitals is more common and may occur either by transmission through the lymph or blood or by contamination of the genitals by the patient herself.

The treatment of tubercular disease of the cervix in advanced cases of phthisis, the author states should be only palliative, but in all other cases energetic and advises hysterectomy for even a circumscribed ulceration if there is no doubt of the diagnosis. The varieties of tubercular disease of the body of the uterus are mentioned, the third or ulcerative being most common and of most importance.

The translator adds a very interesting chapter on tubercular peritonitis,

Intra and extra peritoneal hæmatocele; without denying any of the causes given by the various writers of the intra-peritoneal-variety, the author believes that in the great majority of cases it starts from diseased tubes, some variety of salpingitis or tubal pregnancy and denies the name to pelvic hemorrhage due to constitutional conditions, as scorbutis, icterus, etc.

Conservative treatment is advised unless some grave symptoms supervene, and then opening through the vagina is preferred to abdominal section unless the case be one of ruptured tubal pregnancy.

The subject of ectopic gestation is considered in a very systematic and complete manner. It is divided as to symptoms, diagnosis, prognosis and treatment, according to the stage of development. While the author believes with most recent writers that nearly all

cases are tubal, at least in origin, he does not deny the occasional occurrence of the other varieties.

The different methods of treatment are considered, but a strong preference for removal by laparotomy in all cases is expressed. In cases going beyond the fifth month, the child still living, the first two weeks of the ninth month is the time preferred for operation. In cases after the fifth month, the child recently dead, preference is given to the primary operation rather than waiting for the spontaneous elimination of the fœtus, or the formation of an noxious lithopædion.

Chapter VIII considers the different varieties of vaginitis, with especial attention to that of gonorrheeal origin in the matter of diagnosis and treatment, but nothing unusual is said.

In treating of cysts of the vagina the author denies the proof of the existence of "Skene's glands"; this hardly seems possible in the light of Dr. Skene's careful and undoubted demonstration of them. For the removal of vaginal cysts the partial method is preferred to the complete when they are located in the upper third of the vaginal wall.

In treating of vesico-vaginal fistulæ the author at first admits some credit to Sims and Bozeman, but in a later paragraph retracts it by referring to their work as a period of renaissance of the suture, the old operation of Von Roonhuysen. Bozeman is given credit for his gradual preparatory treatment by dilitation, but no mention is made of Emmet's method of dealing with cicatricial bands. In fact the great work of Emmet is hardly mentioned in connection with this subject, but this only follows out the policy of the author in claiming every thing for the French surgeon. Silver wire or silk worm gut is preferred to silk or catgut for sutures.

Laceration of the perineum so far as the repair goes is treated in full, a detailed account of the different methods of operating by different authors being given. The chapter opens with the surprising statement unmodified that "The perineum is a resistant fibro-muscular floor which closes in the abdominal cavity and supports the weight of the contained viscera."

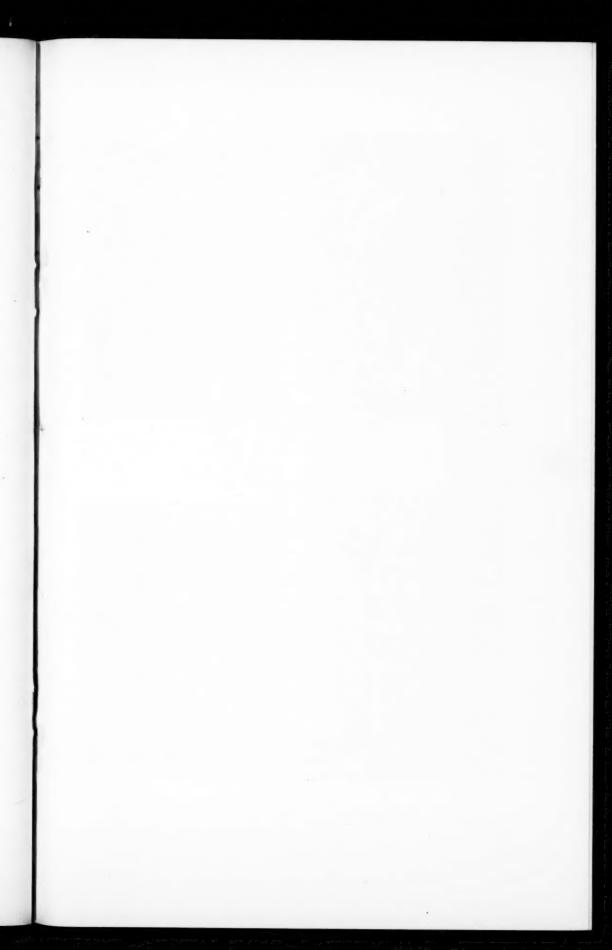
The translator interposes a rather meagre and imperfect description of Emmet's operations, especially so in regard to the introduction of the sutures in the angles of the tear.

In the choice of methods the author seems to depend more upon the rapidity and simplicity of the operation than its applicability and to the especial tear in the case to be operated upon and for this reason favors the method of Lawson Tait. It seems to us that nothing could be more fallacious than to think that any one form of denundation or method of introduction of suture will meet the indications in all cases without regard to the different lesions in the so-called lacerations of the perineum.

The diseases of the vagina and vulva are considered at some length as is also the malformation of the vestibule. The volume is made complete by the chapters on diseases of the urinary tract, and of the rectum and pelvis taken from Anyard's recent work.

Viewed as a whole the work is a most excellent one and will well repay a careful reading by every gynæcologist.

L. C. B.

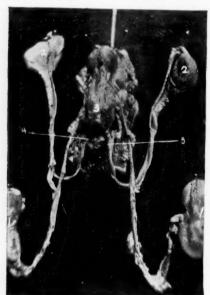




SPECIMEN No. o.

A section of a male chicken, showing the testicles, vas deferens, the kidneys and their ureters, the rectum, the caeca and cloaca.

1-1. Testicles. 2. Vas deferens. 3. Left kidney. 4. Left ureter. 5. Rectum. 6. Cloaca.



SPECIMEN No. 6.

Implantation of both vas deferens into the rectum with recovery. Dog killed on the 24th day.

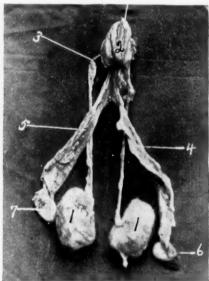
I-1. Kidneys. 2-2. Testicles. 3. Bladder,
4. Point of implantation of left vas deferens into rectum.
5. Point where right vas deferens with fold of peritoneum has adhered to bladder, and proximal end of vas deferens, near point where distal end is implanted into the rectum.



SPECIMEN No. 5.

Bilateral implantation of the ureters into the rectum. Dog died of acute peritonitis on the $3d\ day$.

1-1. Kidneys. 2. Insertion of right ureter into rectum. 3. Insertion of left ureter into rectum.
4. Atrophied bladder.



SPECIMEN No. 7.

Ligation of one ureter. Implantation of folds of the peritoneum. Dog died of acute peritonitis on the $\iota_3 th$ day,

1-1. Kidneys. 2. Bladder. 3. Point of ligation of the right ureter producing hydronephrosis. 4 and 5. Fallopian tubes. 6 and 7. Ovaries.

EXPERIMENTAL RESEARCH ON THE IMPLANTA-TION OF THE URETERS INTO THE RECTUM.¹

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PREFACE.

I T has been the object of the author of this paper to demonstrate, by experimental research, the possibility of relieving many of the grave disorders of the bladder, in which the urine constitutes a permanent source of the irritation, by deviating the course of the urine from the bladder into the rectum; also to avoid the necessity of performing a nephrectomy in laparotomies for neoplasms, in which one or both of the ureters may be involved, by implanting the ureter into the rectum.

The numerous pathological conditions to which the bladder is heir, that sooner or later must terminate fatally, unless some relief, other than that known and practiced at the present time, is afforded, is sufficient ground for warranting the following experiments in search of some surgical procedure that would furnish permanent relief to those suffering from these distressing maladies, by the physiological exclusion of the bladder by operative interference.

COMPARATIVE ANATOMY.

It will be observed by examining the specimen from the chicken (see plate No. 1) which consists in a section of a male chicken, including the lungs, the testicles with the vas deferens,

¹Read before the Section of Surgery and Anatomy of the forty-third annual meeting of the American Medical Association held at Detroit, Mich., June 7 to 10, 1892.

the kidneys with their ureters, and the cloaca with a portion of the rectum and the two cæca: that the ureters empty into the cloaca, which is simply a continuation of the rectum; and that what we propose to produce by artificial means in the dog is a natural condition in the chicken, and in fact in all fowls excepting the ostrich, which is the only bird honored with a bladder.

You will observe by examining this specimen that the ureters and vasa deferentia are bound together by a fold of the peritoneum, which I have removed on the one side, separating the two conduits, in order that they may be more easily traced from their origin in the testicles and kidneys, to their termination in the cloaca.

In the dog the location of the kidneys and the ureters compare very closely with that of man, and the same may be said of the bladder, although the pelvic cavity in the dog is not proportionately quite as deep as that of man. The relation of the ureters in the dog, with that of the large arteries, veins, nerves. intestines and vas deferens are practically the same as that of man, with the possible exception that the ureters lie more loosely imbedded in the peritoneal fold, than in man. The vas deferens in the dog, however, passes further back over the fundus of the bladder, and then takes more of a parallel course with the ureter than in man. They both pass along the sides of the bladder side by side, the ureter passing over the spermatic cord into the bladder at its lower third, while the cord continues on down along the neck of the bladder, and enters the prostatic portion of the urethra at its upper side. During their passage along the lower. half of the bladder, they are held firmly to the latter by the peritoneum. Before that they both lie in loose folds of the peritoneum and continue their parallel course for some distance (varying in different dogs), and then separate, the one passing back to the testicles and the other up to the kidneys.

PATHOLOGICAL ANALOGY IN MAN.

In recto-vesical fistula, occurring in man, we have in a crude manner, a condition produced by disease, analogous to the natural condition found in the fowl, whereby the urine finds its way into the rectum through a fistulous opening, and is passed with the stools. In this condition the rectum usually becomes reconciled to the presence of the urine, and were it not for the escape of the fæces into the bladder and producing acute cystitis, there would be little to fear from this malady, excepting some possible inconvenience.

PRELIMINARY CONCLUSIONS.

With this condition occurring as a natural mode of existence in the fowl, and a pathological predicament found occasionally in man, in which the rectum becomes reconciled to these abnormal circumstances, we are led to the conclusion that with proper surgical care, the urine can be turned into the rectum, and the bowel be made to accommodate itself to its continued presence. We may thereby be enabled to relieve grave pathological conditions arising in the bladder, (that are aggravated by the presence of the urine in that receptacle,) as well as injuries to the ureter in laparotomies, which would otherwise require a nephrectomy, and thus prolong life and give a degree of comfort to a class of patients who without relief, have little to look forward to in this world excepting continued suffering and final dissolution.

Encouraged by these preliminary considerations, we determined to conduct a series of experiments on dogs, with a view of settling so far as we could, the feasibility of such a surgical procedure, together with some of the difficulties that attend such an operation.

EXPERIMENTS.

Our experiments have been confined to an attempt at unilateral and bilateral implantation of the ureters into the rectum, and the special methods by which it was accomplished or attempted, will be detailed in the following cases.

EXPLANATION.

The first eight experiments were made between the hours of 10 o'clock P. M. and 2 o'clock A. M., with the aid of a lamp, which did not afford sufficient light for properly conducting a class of experiments of this character; and hence the mistakes which as a natural consequence followed. But whilst the mistakes were perplexing, yet they are not without some value, and have fur-

nished suggestions for further experimental investigations at some future time.

After the eighth experiment, arrangements were made to conduct our work in daytime, in a well lighted room; even at the expense of severe criticism by a puny paper, and a few anti-vivisectionists, who think more of worthless curs than they do of their fellow man.

EXPERIMENTS.

Experiment No. 1 was only for the purpose of studying the anatomy of the abdominal viscera of the dog with special reference to the relations of the kidney, the rectum, the bladder, the Fallopian tubes and the ureters, with each other, in a living dog.

UNILATERAL IMPLANTATIONS.

Experiment No. 2 was made on a large healthy young dog of thirty-five pounds, and the right ureter ligated about half an inch from the bladder, and subsequently divided above the ligature, and the ureter with a portion of its surrounding peritoneum dissected out for a distance of about two inches.

The rectum was then opened in a line with its long axis about six inches above the anus and the ureter inserted through this opening, and held there by a pair of forceps, and the slit in the bowel closed with six continued sutures, which included the fold of the peritoneum, which was removed with the ureter, thus fixing the latter firmly in the opening of the bowel without transfixing it or obstructing its lumen, and at the same time holding the peritoneal surface of the rectum and ureter in close contact, in order to assist in securing rapid adhesions.

After thoroughly cleansing the abdominal cavity the external wound was closed with a continuous silk suture, and the wound dressed antiseptically. For two days after the operation his dogship was a little feverish and drank both water and milk, but ate little. After the second day, however, he improved rapidly; the abdominal wound healed by first intention, and his appetite became good, eating anything of the food kind he was given.

The bowels did not move for three days after the operation, when he had several watery stools. From that on his bowels moved regularly, from three to five times a day; usually two or three of the stools were of a very watery character, whilst the rest of the stools were semi-solid. At no time did they contain any blood. On the

sixth day after the operation he was removed from the warm room to the barn, and on the eighth day all the dressings were removed. He was kept confined until the fourteenth day when he was given his liberty. He recovered fully, but some eight or ten weeks after the operation an officious student killed him and removed the specimen during my absence; unfortunately this unwarranted procedure lost me the specimen, as it was rendered useless by wanton mutilation.

Experiment No. 4 was on a small young bitch of the lap dog persuasion, of about eight pounds in weight and rather delicate. The right ureter was ligated about an inch from the bladder with a silk ligature, after which it was divided and the renal end held with a pair of forceps, while it was loosened from its peritoneal mooring for about two inches, being careful not to strip off the peritoneal cover that partially surrounded it.

The rectum was opened about six inches above the anus on its lower aspect, in a line with its long axis, which opening was about half an inch in length. After controlling the hemorrhage the ureter was inserted into the rectum, and fastened there by a continuous silk suture, which included its peritoneal covering, and by the inversion of the edges of the rectal wound, I was enabled to bring the serous membranes of the two edges of the bowel in close contact with the serous covering of the ureter, thus facilitating rapid adhesions; the remainder of the rectal wound was then carefully closed with a continuous suture.

The abdominal cavity was thoroughly cleansed, and the intestines carefully replaced, and the external opening closed with a continuous silk suture, and the usual bandages applied, and the dog placed in a warm room. She soon recovered from the operation, and drank freely of milk and water; after the third day she was given solid food; the bowels moved freely on the same day, but we could not discover any blood in the stools; from that on they moved two or three times daily, the stools being watery, mixed with solid and semi-solid faces.

The animal continued to improve steadily, and by the twelfth day ate and drank as usual, but continued to have about the same number of stools, and of the same general appearance as those already described. On the 24th day after the operation she was to all appearances just as well as ever, when she was asphyxiated with carbon dioxide, and the result of the operation carefully examined. The post-mortem revealed some adhesions of the intestines to the parietal peritoneum along the line of the external incision, also adhesions of the uterus to the under side of the rectum, and adhesions to the Fallopian tubes on each side of the wound in the rectum, which

intruded very much on the right ureter, (which, of necessity, lay over the right Fallopian tube), and as a consequence obstructed the lumen of this ureter. With the exceptions of a few adhesions around the cystic end of the ureter, which were continued over the fundus of the bladder, there was nothing worthy of further mention pertaining to the viscera.

By examining specimen No. 4 (see plate No. 4a) you will observe that it consists in a section of the rectum, both kidneys and ureters, the uterus and both Fallopian tubes, together with the bladder. The right kidney is congested and shows evidence of acute nephritis, which I think was caused by the adhesions of the right Fallopian tube to the rectum and right ureter, the adhesion of which had partly obstructed the ureter, and thus produced hydronephrosis with some acute nephritis from the damming up of the urine. It is interesting to notice how perfectly the right ureter is welded, as it were, into the rectum, almost as perfectly as if it had grown there naturally whilst nature has used one of the crescentic folds of the mucous membrane of the bowel to act as a valvular protection at the opening of the ureter, which has been implanted into its walls. (See plate No. 4b).

It will be observed that notwithstanding the constant flow of urine into the rectum, there was not the least evidence of irritation of its mucous membrane. The bladder had become very much contracted, whilst the left kidney and its ureter, the Fallopian tubes, and ovaries, remain perfectly normal.

Experiment No. 9 was made on a bull pup of about fifteen pounds The ordinary abdominal incision was made, and the left ureter was implanted into the rectum. In this case the incision in the rectum was only large enough to admit the ureter, without constricting it. The rectal wound was closed with two aseptic silk sutures; the lower suture was taken after the manner of the Lembert stitch, which also included the flaps of the peritoneum on either side of the ureter, being careful at the same time not to include the ureter and to carefully invert the edges of the wound in the rectum, thus closing the rectal wound and fixing the ureter in the same, as well as bringing the serous surfaces in close contact with each other. The upper suture was taken in the same manner, with the exception that it was passed under the ureter instead of over it, as in the lower suture; thus leaving the lumen of the ureter free from mechanical stenosis. Aseptic silk was used to ligate the cystic end of the ureter, which soon becomes encysted. The external wound was closed in the ordinary mannner, and his pupship placed in a warm room, which was evenly heated by a furnace. He soon rallied from the operation and the following day his bowels moved; the fæces being mixed with urine, which was easily detected by their peculiar odor. He drank freely of milk and did not seem to be particularly disabled. On the third day after the operation he ate some, and drank freely of milk, and from that on, no particular attention was given in reference to his nourishment, except that he was furnished with plenty. On the fourth day we removed the dressing and found the external wound practically healed by first intention; and on the sixth day he was removed to the barn and given common ordinary accommodations, with coarse food mixed with bones, of which he ate freely and experienced no inconvenience. His bowels moved regularly two or three times a day, the stools being mixed with urine, and at the same time he would occasionally pass urine from the bladder. Having fully recovered he was asphyxiated on the 25th day after the operation, and the result of our experiment investigated. The external wound had healed with but few adhesions to the bowels and omentum.

By examining specimen No. 9 (see plate No. 9a), you will observe the bladder is very much atrophied; and by a close examination of the specimen, the encysted ligature used in tying the cystic end of the ureter can easily be seen. On further examination you will find the left kidney normal, as well as its fellow, whilst the ureter of the left kidney will be found completely attached to the rectum, just as perfectly as if it was in its normal position, and nature had placed it there. Not the least renal congestion existed, and not a particle of hydronephrosis, showing that the lumen of the ureter was not in the least obstructed. There was no difficulty in passing a ligature from the pelvis of the left kidney through the ureter and out of the opening in the mucous membrane of the rectum, (see plate No. 9-b), or by pouring water into the pelvis of the kidney, it will find a ready escape through the ureter into the rectum. You will also observe that nature has done its work in uniting the mucous membrane of the rectum, with that of the ureter, perfectly, whilst the artificial opening in the rectum is carefully guarded by a fold of the rectal mucous membrane. In fact the specimen is almost a unique one, and clearly demonstrates the practical possibility of implanting the ureter into the rectum, thus diverting the urine from its natural receptacle to the rectum, without serious injury.

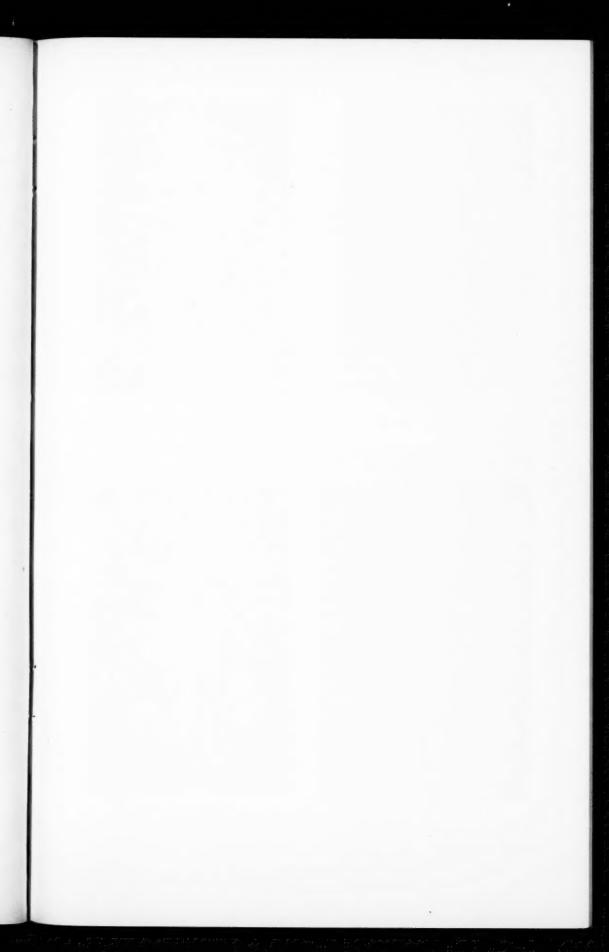
BILATERAL IMPLANTATIONS.

Experiment No. 3 was made on a small, delicate bitch of ten pounds weight, which had had pups about eight weeks previous to the

operation, and consisted in the implantation of both ureters into the rectum. Owing to her recent puerperal state she was very vascular, causing us more than the usual amount of trouble from hemorrhage during the operation.

When the abdominal cavity was opened a wonderfully distended bladder was found, that reached more than two-thirds of the way to the transverse colon, which we were obliged to empty before proceeding with the operation. After considerable difficulty the bladder was finally emptied, when we proceeded with the next step of the experiment which consisted in ligating both ureters about half an inch from the bladder. Having had a great deal of trouble in inserting the ureter into the rectum and holding it there without injury, and at the same time to prevent the escape of the urine into the peritoneal cavity, we decided to devise some other plan than the one previously employed. With the aid of a few suggestions from my friend Dr. J. W. Craig, we devised the following method, which consists in throwing a loop around each ureter, consisting of a double-braided silk ligature, with the ends tied together and armed with a slightly curved needle, this served two purposes-first, to prevent the possible escape of urine into the peritoneal cavity; and second, to assist in inserting the ureters into the artificial opening in the rectum. Having the ureters both ligated at the cystic end and firmly held with a silk noose, as it were, at the renal end, we divided each of them between the ligature and the noose, after which the renal end was carefully dissected loose from the lumbar peritoneum, being careful to leave the ureter covered with a flap of peritoneum for its protection and nutrition.

These loops were intrusted to an assistant, who kept them on a gentle stretch until a slit about an inch in length was made in the rectum, which in this case was opened about six inches above the anus on its lower aspect (when the dog is standing), in a line with the long axis of the bowel, and a grooved director inserted about an inch into this opening from above downward. The needle attached to one of the loops surrounding the ureter was then taken and inserted along the grooved director and carried out about an inch below the inferior commissure of the opening in the rectum. By gently pulling on this ligature the ureter was easily carried into this slit in the rectum; the same procedure was had on the other ureter, which in this case was inserted in the same incision with its fellow. It was our aim to have from half to three-quarters of an inch of each ureter inserted into the rectum: we then closed the rectal wound with a continued silk suture, which embraced the flaps of the peritoneum surrounding the





SPECIMEN No. 3a.

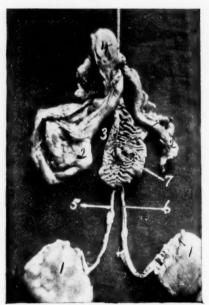
Bilateral implantation of the ureters into the rectum. Dog died of acute peritonitis on the 4th day. (A.)

I-I. Kidneys. 2-2. Ovaries and Fallopian tubes.
3. Rectum. 4. Bladder. 5 and 6. Left and right ureters. 7. Point of implantation of ureters into rectum.



SPECIMEN No. 4a.

Implantation of the right ureter into rectum. Dog killed on the 24th day after the operation. (A.) 1-1, Kidneys. 2-2. Ovaries and Fallopian tubes. 3. Rectum. 4. Atrophied bladder. 5. Left ureter. 6. Point of implantation of right ureter into rectum.



SPECIMEN No. 3b.

Bilateral implantation of the ureters into the rectum. Dog died of acute peritonitis on the 4th day, (B.)

1-1. Kidneys. 2-2. Ovaries and Fallopian tubes, 3. Mucous membrane of rectum. 4. Bladder, 5 and 6. Right and left ureters. 7. Ends of ureters protruding into rectum.



SPECIMEN No. 4b.

Implantation of the right ureter into the rectum. Dog killed on 24th day after operation.

1-1. Kidneys. 2. Fallopian tube and ovary. 3. Mucous membrane of rectum, 4. Opening where right ureter enters rectum.

ureters, thus firmly fixing them in the rectum, at the same time without obstructing the lumen of either ureter.

The loops were then put on the stretch and cut off close to the peritoneal coat of the bowel, the elasticity of which allowed the loops to drop into the lumen of the rectum, whilst the peristaltic action, together with the passage of the fæces would sweep them off of the ends of the ureters and carry them out with the stools. The abdominal cavity was then thoroughly cleansed with a warm solution of mercuric chloride, the intestines carefully replaced, and the abdominal wound closed with a double row of continuous silk sutures, with which I first closed the peritoneum and muscular walls, and afterwards the integument. I then applied a compress with a bandage, over which was placed a dressing made out of coffee sack, when she was placed in a warm room to revive. She soon rallied and drank water and milk, and had several watery stools mixed with solid fæces, but died on the fourth day.

A post-mortem was made, which showed that she died from acute peritonitis confined chiefly to the right side, the bladder being the centre of the inflammation, which extended upward along the right Fallopian tube. I am satisfied that the rough usage of the bladder, due to its extreme distension and the effort in emptying it, during the operation was the prime factor in producing the peritonitis, which, however, did not reach the point of the insertion of the ureters in the rectum.

By examining specimen No. 3 (see plate No. 3a), which consists of the bladder, a portion of the rectum, vagina, uterus, Fallopian tubes, ovaries, both kidneys and their ureters (unfortunately the one ureter was torn off by rough usage after the specimen had been placed in alcohol), you will observe (see plate No. 3b) that both ends of the ureters can easily be seen extending through the walls of the rectum into the lumen of the bowel; and, notwithstanding the very short time after the operation, they were quite firmly fixed in the walls of the rectum by adhesion of their serous surfaces. The bladder shows incipient atrophy, whilst the kidneys are apparently normal in every respect and the rectum shows no evidence of inflammation or irritation.

Experiment No..5 (see plate No. 5) was made on a small old dog of the "lap-dog" species, which was undergoing fatty degeneration, and which had a floating kidney on the left side. In this case we inserted the left ureter about five inches above the anus, and the right ureter about seven and a half inches above the anus, in two separate

openings, each of which was closed by a continuous suture in the same manner as described in No. 3.

This dog never seemed to rally from the operation, but was drowsy and stupid, ate nothing, drank but little, and died on the third day. The autopsy revealed enlargement of the left kidney, which you will observe was commencing to undergo suppurative inflamma-The ureter on the right side, you will notice, extends fully one-fourth of an inch into the lumen of the rectum, the end of which is sloughing off, whilst the adhesions of the serous membranes of the ureter to those of the serous surface of the bowel shows a marked degree of repair for the short time elapsed after the operation, and the unfavorable condition of the dog to start with. Unfortunately the right ureter was so occluded at the uretero-rectal juncture as to very materially obstruct the flow of urine which caused some hydronephrosis, which threatened the destruction of its cortical substance. The rectum at the point of insertion of the left ureter shows the results of peritoneal inflammation, which has retarded the repair of the rectal wound in this instance more than in that of its fellow. You will observe this ureter protrudes through into the rectum about threefourths of an inch, and whilst it shows the evidences of sloughing, there was no obstruction of its lumen, and the kidney is apparently perfectly healthy. The bladder is exceedingly small and contracted from non-use, but otherwise normal. You will perceive that I made the openings into the rectum more to the vertebral side of the bowel than in either of the former specimens, although I do not consider it of any advantage, as the hemorrhage from the hemorrhoidal vessels is more profuse the nearer you approach the vertebral aspect of the rectum.

In this case death was undoubtedly the result of acute general peritonitis, which together with the fatty degeneration of the dog, prevented the reparative process of the wounds that under more favorable circumstances would have been further advanced.

Experiment No. 6 was made on a young dog of about twenty-five pounds in weight, with all the indications of being in vigorous health. The operation consisted in the *supposed* implanting of both urecers into the rectum about five inches above the anus. In this case we were annoyed considerably by hemorrhage from the hemorrhoidal vessels and also from the peristaltic action of the bowels forcing out the fæces. Both ureters were supposed to have been implanted into the rectum, as previously described. The abdominal cavity was thoroughly cleansed with a bi-chloride solution, and the intestines carefully replaced, and the external opening closed by a double row of continuous silk sutures. The dog soon rallied and

took milk and water in small quantities, and by the third day seemed to feel quite comfortable. On the third day he had a motion of the bowels, which was of a watery character with semi-solid fæces. From that time on his bowels moved several times each day, the stools being free and semi-solid. By the fifth day he commenced to eat solid food with a relish. On the 13th, we removed all the dressings, and found the external wound healed. He was then taken from the warm room and placed in the barn, where he was kept until the twenty-fourth day, at which time he had every appearance of being perfectly well; when he was asphyxiated by carbon dioxide, and an examination of the results of the operation carefully conducted; which revealed the fact (see specimen No. 6, plate No. 6), that we had mistaken the spermatic cords for the ureters, and had implanted both of the vasa deferentia into the rectum, whilst the ureters escaped entirely. This may appear like an inexcusable mistake, yet when we review the anatomy of the vasa deferentia and their relation with that of the ureters it will be observed that their similarity in size and outward appearance, as well as the sensation they give to the touch, together with the parallel course they take along the side of the bladder, in such close proximity to each other, being bound side by side to the lateral aspect of the bladder by peritoneal coverings, will in part at least aid you in appreciating some of the difficulties attending the operation, and the possibilities of mistaking the one for the other; until repeated operations enables the operator to become so familiar with every part of the pelvic anatomy as to positively diagnosticate between the ureters, vas deferens, and folds of the peritoneum, by the touch, which was my only method (owing to the use of a lamp which did not furnish me sufficient light to see them), which I have found is not so easily done as might be supposed.

Specimen No. 6, however, is not without interest, and shows the results of the operation, which, although a failure as to its original intents and purposes, proves the feasibility of successfully implanting both vasa deferentia into the rectum, and thus render the male harmless, in regard to his reproductive powers, without destroying his capacity for participating in copulation as usual, as was accidentally demonstrated in this particular instance.

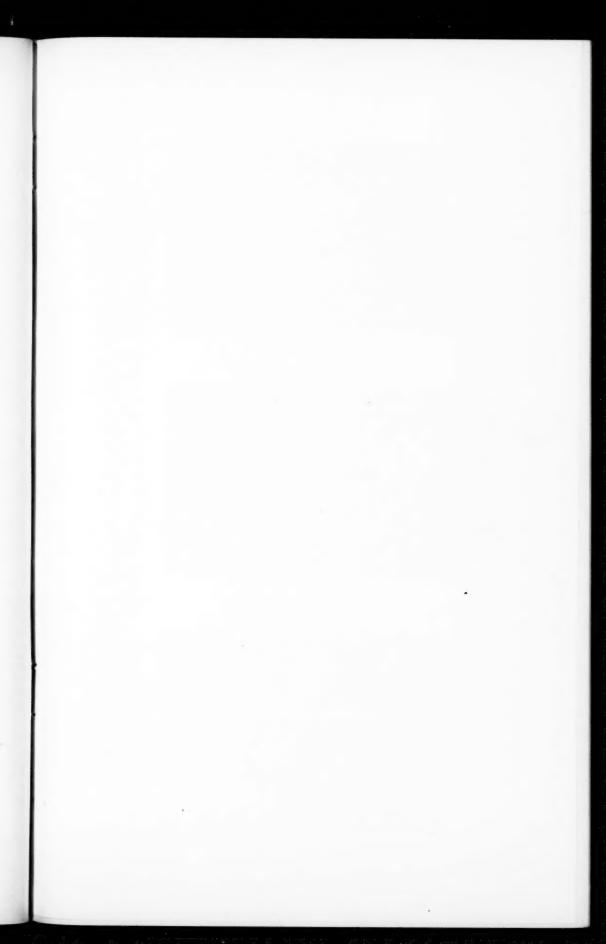
Experiment No. 7 was on a large Newfoundland bitch of fortyfive or fifty pounds in weight. A six-inch opening was made in the abdominal cavity, and the ureters searched for, but owing to the profuse hemorrhage it was very difficult to find them. Numerous small vessels had to be ligated, which ordinarily would have given us no trouble, but which in this case bled freely, and especially was it the case with the hemorrhoidal vessels, several of which we were compelled to ligate. What we supposed to be the ureters, were implanted into the rectum in the same manner as already described.

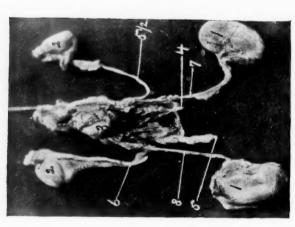
The abdominal cavity was thoroughly cleansed, and the intestines replaced, and the external wound closed with a continuous silk suture. The usual antiseptic dressings were applied, and the dog placed in a warm room to recover. She rallied from the operation without any trouble and seemed to feel quite well the next morning, when she drank both milk and water, and with the exception of vomiting occasionally, she showed but little inconvenience from the operation. The bowels moved the second day after, when her appetite returned and her recovery seemed to progress without any apparent interruption. The bowels moved from two to four times a day, the stools being of a watery character at times, and at others quite solid, mixed with some liquid. On the eighth day she was taken from the warm room to the barn; but on the eieventh day she was taken with symptoms of peritonitis and began passing watery stools mixed with blood, and died on the thirteenth day.

A post-mortem examination revealed the fact that she died of acute peritonitis. There were no adhesions to speak of, but some serous effusion into the peritoneal cavity, and general congestion of the entire abdominal viscera. In this case we were again misled, but not as in the former case, by the vas deferens, but by a fold of the peritoneum, which we had implanted into the rectum instead of the ureters.

By examining specimen No. 7 (see plate No. 7), you will observe that we succeeded in ligating the right ureter close to the bladder, but were misled by a fold of peritoneum, which was dissected loose and implanted instead of the ureter. On the left side we were not even so fortunate as to get the ureter ligated, but missed it entirely; being again misled by a fold of the peritoneum. This case, like the former, proved that it was an ill wind that did not blow some good.

The important part of this operation was the fact that one ureter was ligated for nearly two weeks and yet did not set up destructive inflammation of the kidney, whose ureter was distended with urine to the size of your little finger, whilst the pelvis of the kidney was distended to the size of a small hen's egg; notwithstanding the hydrone-phrosis, there was not to exceed an ounce and a half to two ounces of urine in both; evidently being the whole amount of urine secreted by that kidney, during nearly a fortnight, which shows almost a complete suspension of the functions of the kidney for that period (or,

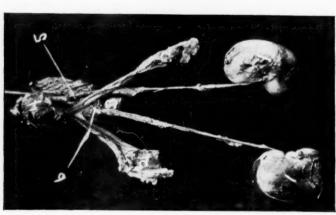




SPECIMEN NO. 8.

Implantation of folds of the peritoneum. Dog killed on the rath day.

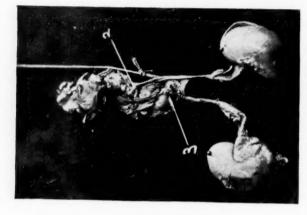
1. Kidneys, 2-2. Testicles, 3. Bladder, 4 and 5. Recurrent folds of the peritoneum implanted into the rectum. 5% and 6. Vas deferens. 7 and 8. Ureters.



SPECIMEN NO. 10.

Implantation of both ureters in the rectum. Dog died 36 hours after of acute peritonitis.

1-1. Kidneys, 2-2. Ovaries and Fallopian tubes, 3. Rectum, 4. Bladder, 5. Right ureter, 6. Left ureter,



SPECIMEN NO. 11.

Implantation of both ureters. Dog died 72 hours after operation of acute nephretis.

1-1. Kidneys. 2. Right ureter. 3. Left ureter. 4. Bladder. 5. Rectum.

possibly, reabsorption of the urine), without even inflammation or destruction of its cortical substance. You will observe the rectal wound has healed, whilst the implanted peritoneal fold has sloughed off on the mucous side of the rectum; and with the exception of a few frail adhesions, over the wound of the rectum, the abdominal viscera were just as if nothing had ever happened.

In this case, as in No. 6, we were again surprised at our mistake, which impressed us more than ever with the difficulty of learning to distinguish, by the touch, different organs of the abdominal cavity, and the necessity of being enabled to more satisfactorily apply the sense of vision in these experiments; and yet our mistake is not without value; and hence we have recorded it in this report.

Experiment No. 8 was on a young shepherd dog of twenty pounds weight, on which we presumed to have implanted both ureters about five inches above the anus. During the operation we had to ligate several branches of the pudic and hemorrhoidal arteries. Owing to a distended bladder, the operation was proportionately complicated, and rendered more difficult.

In this case the same methods were followed as in the cases already described. The dog soon rallied from the operation, and the next morning drank milk quite freely. On the third day the bowels moved very freely, and from that time on he seemed to improve, eating and drinking regularly. His bowels continued to move two or three times a day, and were of a semi-solid character mixed with liquid. On the twelfth day he was asphyxiated with carbon dioxide, and the results of our efforts examined. With the exception of a few adhesions, the abdominal viscera presented a normal appearance. Again, to our surprise and chagrin, we found that we had failed to secure the ureters, but had implanted a fold of the peritoneum on each side, instead of the ureters, which we found unmolested.

By examining specimen No. 8 (see plate No. 8) which consists of both kidneys and their ureters, both testicles with their vasa deferentia, a section of the rectum, with the bladder and prostate, you will observe that the rectal wound has been completely repaired, the ends of the implanted peritoneal folds having both sloughed off on the inside of the bowel, the mucous surface of which had healed completely. On the one side of the rectum you will notice a portion of the peritoneal fold which was implanted and which I have purposely left. Unfortunately, the one on the opposite side was so adherent to a loop of the ilium as to render it impossible to separate and preserve it.

This specimen shows very clearly the close relations maintained between the ureters and vas deferens, both before and after reaching the bladder; you will notice that after running a parallel course for nearly two inches, the ureter passes (when the dog is standing) under the vas deferens, and enters the bladder at its lower third, whilst the vas deferens continues down along the side of the bladder, and finally, after passing over its neck, enters the urethra at the beginning of the prostatic portion. The spermatic vessels, it must be remembered, separate from the vas deferens soon after entering the abdominal cavity, whilst the latter is enwrapped in a loose fold of the peritoneum and continues its course alone until it meets the ureter from an inch to two inches above the bladder, where they take a parallel course as already described.

Experiment No. 10 was made on a twenty-pound bull bitch pup in the same manner as heretofore described, excepting that this experiment was made in day time and with all the advantages a good light afforded, and instead of making half-inch incisions in the rectum, as heretofore, we made very small openings just large enough to admit the ureter without constricting it, and closed the opening into the bowel with a modified Lembert suture, the same as described in No. 9, under the head of "Unilateral Implantations." The right ureter was inserted very low down near the bladder, and the left about three inches higher up. We had considerable trouble with the Fallopian tubes; which is always the case in making this operation on the female dog, as the ureters pass over the Fallopian tubes when the dog is standing, and, consequently, when lying on its back in an operation, they are under, and we are obliged to cut through the peritoneal folds of the Fallopian tubes in order to bring the ureters through them into the rectum, which always produces more or less hemorrhage and increases the chances of peritonitis.

In the canine it must be remembered that the Fallopian tubes are very long, and frequently extend more than half way from the bladder to the stomach, and consequently are always in the way when making this operation. This dog rallied slowly, and died of acute peritonitis thirty-six hours after the operation.

You will observe by examining specimen No. 10 (see plate No. 10) that both ureters were implanted in the rectum and were held in place by the ligatures and plastic adhesions, the latter of which had already been developed. By examining the ends of the ureters, which protrude into the lumen of the bowel, it will be observed that one of the loops (already described) used in drawing the ligature into place still remains, but the loop has been cast off from the right ureter. There was no hydronephrosis, showing that no obstruction of the ureters had been produced.

Experiment No. 11 was made on a puny mongrel of about 15 pounds weight. The ordinary operation was made and the right ureter was implanted in the rectum about an inch above, and the left about two inches above the bladder. The dog rallied promptly and partook freely of milk and water, in which we gave him some tincture of opium. The second day, however, symptoms of acute nephritis set in, from which the dog died in 72 hours after the operation, which fact was confirmed by the post-mortem examination.

There was slight obstruction of the right ureter, producing hydronephrosis with intense inflammation of the right kidney. There was no obstruction of the left ureter, which was intensely congested, as was also the left kidney. By examining specimen No. 11 you will observe that both ureters were perfectly implanted in the rectum, and their serous surfaces were nicely welded to the peritoneal walls of the same by plastic lymph.

The right ureter was unfortunately torn from its nidus in the rectum by the rudeness of my assistant while making the post mortem. I have replaced it as near as possible as it was before the accident. There was but little peritoneal inflammation or rectal irritation; the dog had passed several liquid stools between the time of the operation and his demise. The sloughing process which was taking place is plainly shown by an examination of the rectal ends of each ureter.

Experiment No. 12 was made on a young shepherd dog of about 20 pounds weight. Both ureters were introduced in the usual manner and covered with a flap of omentum, which was stitched to the rectum with fine catgut sutures, thus supporting the ureters and at the same time protecting them as well as guarding against the possible escape of fæcal matter from the rectum. He soon rallied from the operation, and ate and drank freely, being restricted to fresh beef, milk and water, given in moderate quantities every three or four hours. He was also kept under the influence of opiates until the night of the second day, when he got out of the barn and ran off, and did not return until the morning of the third day, when he returned very much fatigued and somewhat feverish. He refused all food, but would drink freely of water and occasionally would take a little milk.

He did not have a motion of the bowels until the third day so far as we know, the stools being watery and having the distinct odor of urine.

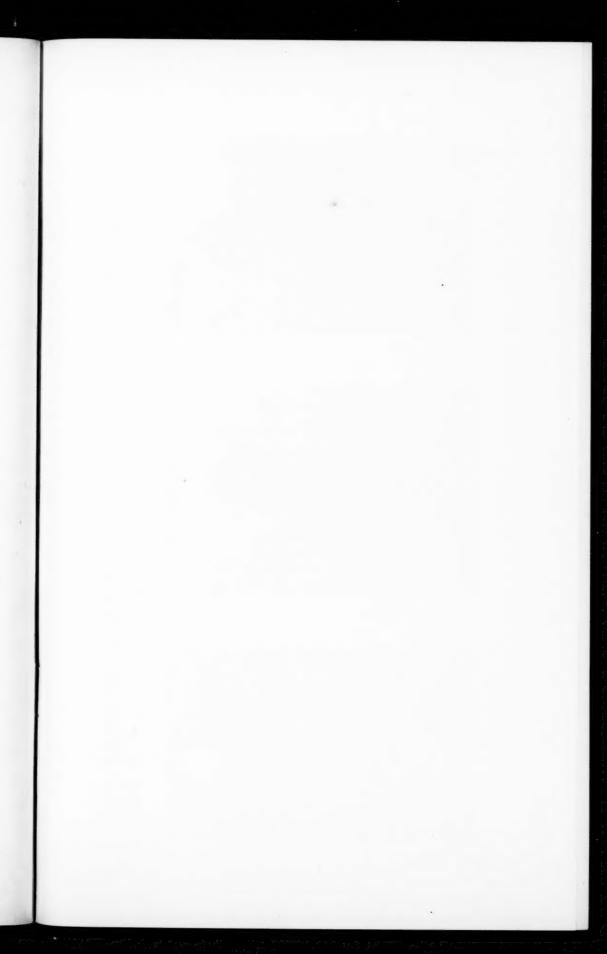
Having found a large circumscribed ecchymosis in the abdominal walls during the operation, the result of an injury received prior to the operation, I suspected this might have some influence in producing his unfavorable condition, which continued to grow worse until he died, 90 hours after the operation. The post-mortem revealed the fact that an abscess had formed in the injured side, which had opened into the peritoneal cavity producing death. Both ureters were found inserted in the rectum, and well adhered, with no evidence of hydronephrosis.

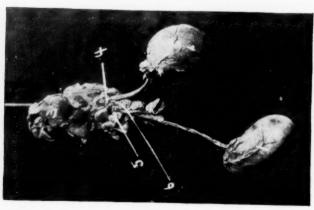
The artificial openings into the mucous surfaces of the rectum were being rapidly repaired, and, notwithstanding the presence of the urine, the mucous membrane of the bowel did not show the slightest irritation. The bladder had taken on physiological atrophy, the result of non-use, until it had diminished to the size of a hickory nut. We are inclined to believe that the injury received prior to the operation ruined what otherwise promised to be a successful bilateral implantation. Unfortunately, however, an accident destroyed this specimen, which we are unable on that account to exhibit, very much to our regret.

Experiment No. 13 was made on a mongrel coach dog of about 30 pounds. Both ureters were implanted into the rectum in the manner already described; after which they were securely covered with flaps of omentum. This dog soon rallied and drank freely of milk and water. He passed urine per rectum the next morning after the operation, and continued to do so once or twice a day with marked regularity. He was given light doses of opiates, although he showed little evidence of pain until the fifth day after the operation, when symptoms of peritonitis set in, which rapidly increased until he died on the morning of the sixth day after the operation. The post-mortem revealed death to be the result of peritonitis and nephritis. By examining specimen No, 13 (see plate No. 13) you will observe that both ureters were firmly attached to the rectum and were held there in part by the omentum, which we removed from the one, but left remaining on the There was a slight degree of hydronephrosis showing some stenosis of the ureters, although not enough to have produced any serious damage to the kidney. (Judging from the amount of injury they will bear without serious results from ligation of the ureters, producing marked distension of the same, as well as of the kidney, from the accumulation of the urine.)

GENERAL REMARKS.

You will observe we have made in all twelve experimental operations, with reference to the implantation of the ureters into the rectum. Three were unilateral implantations, and nine were intended for bilateral implantations, of which only six proved to be double implantations of the ureters, whilst

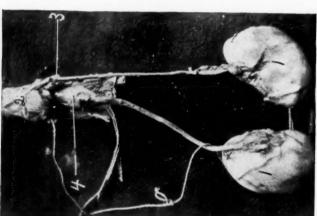




SPECIMEN NO. 13.

Implantation of both ureters. Dog died 144 hours after operation of acute nephretis complicated with acute peritonitis.

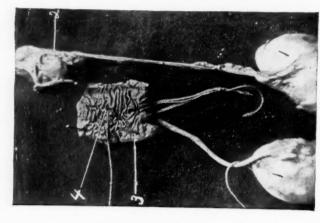
1-1. Kidneys, 2. Rectum. 3. Bladder. 4. Right ureter. 5. Omental flap covering left ureter.



SPECIMEN No. 9a.

Unilateral implantation of the left ureter into the rectum. Dog killed on the 25th day after operation. (A.)

1-1. Kidneys. 2 Atrophied bladder. 3. Right ureter near entrance of bladder. 4. Left ureter implanted into rectum.



SPECIMEN NO. 9b.

Unilateral simplantation of the left ureter into the rectum. Dog killed on the 25th day after operation. (B.) 1-1. Kidneys. 2. Entrance of right ureter into arrophied bladder. 3. Mucous side of rectum. 4. Opening of ureter into rectum with cord passed through it.

two proved to be only the insertion of the folds of the peritoneum, and one proved to be the ingrafting into the rectum of both vasa deferentia. These experiments have been strung out over a period of over three years; and eight of them were conducted between the hours of ten and two o'clock at night, by the aid of a lamp, which, owing to the poor light, necessitated our depending largely upon the sense of touch for success.

I was kindly assisted by Drs. J. W. Craig, J. H. Craig, J. S. Hedges, Dr. Frank H. Harding, and occasionally others of the local profession, who kindly gave me all the assistance in their power in prosecuting these experiments, and to whom I am very much indebted for their aid, without which it would have been very difficult for me to have carried on these investigations.

In regard to the unilateral implantations, you will observe that numbers 4 and 9 were successful in every respect, whilst we have every reason to believe that No. 2 was successful also. By assuming that number 2 was not successful, we still have sixty-six per cent. of successful unilateral implantations.

In regard to the bilateral implantations, we are sorry to say we were not so fortunate; for all of the six bilateral implantations terminated fatally.

Of two experiments in which we implanted folds of the peritoneum instead of the ureters, one died (on the thirteenth day) of acute peritonitis, and the other one recovered. In the sixth experiment, however, in which we implanted both vasa deferentia in place of the ureters, the dog recovered with little or no difficulty.

CONCLUSIONS.

1. That the unilateral implantation of the ureter into the rectum is a possible and practical surgical procedure.

2. That the bilateral implantations of the vasa deferentia into the rectum is not followed by any serious or detrimental results, further than rendering the dog sterile.

3. That the simultaneous implantation of both ureters into the rectum is still a questionable surgical procedure, as shown by the experiments made thus far on the dog and also by Küster's double implantation of the ureters in man.

4. That the presence of the urine with the fæces in the rectum does not produce pathological irritation of the latter, but

that the rectum will readily accommodate itself to its presence.

5. That the passing of frequent liquid stools cannot be depended upon as resulting from implantation of the ureters into the rectum, and the presence of urine in that receptacle.

- 6. That these experiments have suggested the probability of a portion of the water of the urine, being absorbed by the r ctum, leaving the salts, etc., of the same to be eliminated from the economy with the fæces.
- 7. That the ligation of one ureter, and the consequent production of hydronephrosis, is not necessarily followed by inflammation and destruction of the wall of the ureter or the substance of the kidney, and suggests one of two things: either the arrest of the secreting powers of the kidneys, or the reversal of the natural physiological process of elimination, for those of absorption.

PRACTICAL OBSERVATIONS.

We firmly believe that these experiments have shown, without much doubt, the practical utility of unilateral implantation of the ureter, in cases where either one of the ureters are involved, from the result of adhesions, from ovarian, or other tumors of the abdominal cavity; and that it is a safer procedure to resort to the implantation of the ureter into the rectum, than to perform a nephrectomy, which has been the custom heretofore. We also believe (and intend at some future time to endeavor to demonstrate by a continuation of these experiments), that bilateral implantations can be made successful by the introduction of one ureter at a time; giving the first one time to recover before the second one is implanted. If this can be accomplished, it will enable us, in cases of disease of the bladder, to divert the urine from that organ to the rectum, and thus either relieve the disease, or, if necessary, extirpate the bladder (which at present cannot be done), without bringing the ureter out through the perineum with all the horrors of such an unpleasant condition, which is only excelled by an artificial anus.

If, however, we have only succeeded in preventing the necessity of a nephrectomy by these experiments, where one or the other ureter is involved by some pathological difficulty in the abdominal cavity, necessitating the same, we will feel justified in the expenditure of the time and trouble these experiments have necessitated.

CONDITIONS DEMANDING EXCISION OF THE GLOBE OF THE EYE.¹

By WILLIAM H. CARMALT, M. D.,

OF NEW HAVEN, CONN.

PROFESSOR OF SURGERY IN YALE UNIVERSITY.

N the division of labor which to-day exists in the medical profession, as well as in so many other fields of labor, the question of the propriety of enucleating an eye will be referred to the specialist in ophthalmology more often than to the general surgeon, and in most cities there are specialists to whom cases involving a more or less chronic course will be almost invariably referred; but there are cases of emergency in which we are called upon to act promptly, and our advice is liable to be asked in consultation in other cases, and it is neither a justification nor an excuse-though much too often advanced, as if actually praiseworthy-to say "I don't pretend to know anything about eyes." Those of us who heard or have read the admirable introduction to his address of the renowned President of the Congress of American Physicians and Surgeons, at its late meeting in Washington, will not soon forget the eloquent warning he there gives against the dangers of a too great tendence to specialism in medicine. It is in this view, rather than that I have anything novel to offer, that I respond to the request of the committee and speak of the conditions demanding excision of the globe of the eve.

In the consideration of this subject, we are at once confronted with it from the two quite different standpoints, according as we have to deal with blind eyes or with those in which there is a more or less useful degree of vision. I shall speak of them separately, and *first*, as to blind eyes.

In these cases the objections to the operation are two: first, the dangers of the operation per se: and second, the cosmetic result. The operation has been followed by death from meningitis—before the days of antisepsis more frequently than at present—but the possibility must enter into consideration now.

¹A paper read before the American Surgical Association, on June 1, 1892.

I am not aware of this untoward result in other conditions than in suppurative panophthalmitis, but it has occurred in these cases when operated upon in the acute stage sufficiently often to make us well hesitate before undertaking it. I have had one such experience in a man about eighty years of age, who lacerated his globe by a blow from a stick of wood in chopping, and who applied to me only when suppuration of the interior of the globe was well advanced. My advice for immediate excision was not followed, but forty-eight hours of continued intense suffering brought about a change of mind, and although I used all the antiseptic precautions I thought justifiable short of the entire cleaning out of the orbit, he died forty-eight hours later of a suppurative meningitis.

Suppurative panophthalmitis is due to septic infection. A traumatism of some kind, be it a foreign body driven into the globe, a lacerated wound from a blow, or the clean-cut incision of a surgeon's knife, is the usual medium of contamination. Thereby the entrance of micro-organisms of suppuration into one of the most fertile culture media that exists is, secured, and the result is a rapid disorganization of all the interior structures of the globe. Intense pain, partly but not wholly due to the inelasticity of the sclera, but the greater dangers of extension of the inflammation and the invasion of the orbital tissues with bacteria, demand the relief which only the excision of the globe will secure. In order to reduce the suppurative process to the shortest possible period of time, the removal should be made as soon as the evidence of pus is unmistakable, before the patient's strength has been reduced by the pain, loss of sleep, and increased temperature. If we wait until the inflammation has penetrated the sclera and the orbital tissues have become infiltrated with microorganisms, the operation, which before this would have been one of comparative freedom from danger, now becomes serious-so much so that in pre-antiseptic days it was regarded as improper to operate upon acute panophthalmitis by so great an authority as v. Graefe. Even now, with the methods at hand of combating sepsis, it sometimes becomes impossible to guard against the extension of the suppuration along the lymph channels of the orbit to the brain, as the case I have just related shows. In this case, as in one of v. Graefe's and in some others, with like fatal terminations, the patients were of advanced years, and how much a sclerosis of the arteries may have had to do with the extension of the disease to the interior of the cranium I cannot say; but, as there are cases of death from the meningitis without the operation, it is not unreasonable to insist that the operation is better done either before suppuration occurs in cases of lacerating or penetrating wounds with loss of vision, or as soon as the evidences of suppuration are sufficiently plain for us to know what is coming. In early stages it is an operation of comparative innocuousness, in the later it threatens the life of the patient.

There is no one condition for which eves are so frequently excised as in sympathetic ophthalmitis (threatened or actual), a disease first accurately described in 1844 by Mackenzie, of Edinburgh, and of which, so far as I know, there is no analogue in our catalogue of the evils to which flesh is heir. It is defined to be "an inflammation of an eve caused by a preëxisting inflammation in the other." (Ref. Handbook of the Medical Sciences. vol. vi. p. 693). In 1857, Pritchard, of Bristol, England, first remarked upon the relief of the inflammation of the fellow-(second or sympathetically affected) eye which followed the removal of the injured or diseased (first affected) eye, and since his advocacy it has been a recognized surgical procedure for therapeutic purposes in suitable cases. How wide are the differences of opinion as to its applicability may be gathered by comparing the utterances of Schweigger, of Berlin, and of Mauthner, of Vienna. Some thirty years ago, the former, in consultation in a case of injury by penetration of a foreign body into an eye, in reply to the inquiry if it would not do to wait for the ophthalmoscopic evidences of sympathetic disease in the second eye before enucleating the injured one, said to me, "When you see anything wrong in the fellow-eye it is already too late" (to save it). In 1878, Mauthner wrote: "Hecatombs upon hecatombs of eyes have been sacrificed upon the altar of prophylaxis to the second eye; the spectre of the sympathetic disease has been a philanthropic mantle covering the acquisition of pathological material." And while I repudiate the slur of the last sentence, which I believe that brilliant writer used for the purpose of exciting attention rather than to state a fact, it certainly shows two things: first, that the disease is regarded with dread by those who have it to treat; and second, that the removal of the offending eye (the exciter) is thoroughly believed to have a useful therapeutic effect upon the disease in the fellow-eye (the sympathizer).

The exact pathology of the sympathetic process is still a matter of controversy—reflecting the medical thought of the day. When the great Scotch ophthalmologist first described the disease from a clinical standpoint, he called it "reflex," and regarded it as being propagated from the injured or diseased eye to the fellow along the optic nerve. In 1859, Heinrich Müller, as the result of anatomical investigation of diseased eyes, claimed that the ciliary nerves were the medium of transmission. In 1878, Mauthner suggested, without insisting, that the blood-vessels were the connecting link in the chain of communication (though in justice to Mackenzie, it should be said that he had also made the same suggestion thirty-five years before). During the last decade, Leber, Berlin, and others, but particularly Deutschman, have investigated the subject from the bacteriological standpoint, with the result of convincing themselves, at least, that the process is infective, and that the optic nerves and their sheaths are the channels by which the microorganisms gain access to the second eye. You will doubtless willingly pardon me if I avoid entering at length into this field of discussion. I have referred to it at greater length in an article in the Reference Handbook of the Medical Sciences, and Dr. Robert L. Randolph, of Baltimore, has given the subject a thorough investigation in the pathological laboratory of the Johns Hopkins University, publishing his results in the Archives of Ophthalmology, 1888, vol. xvii. No. 2, to which I must refer those who wish to pursue the matter further-Suffice it here to say, that to my mind the pathological investigations of the infectious character of the disease are not convincing, and the clinical features are altogether in favor of the view advanced by Heinrich Müller, of the ciliary nerve medium of transmission; and further, the particular subject of our discussion from a therapeutic standpoint, bears out this view better than any other. If the "sympathizer" be affected by reason of the actual presence in it of microorganisms, let the channel of communication be either the blood-vessels or the optic nerve, I cannot understand how the excision of the first affected eye, the "exciter" could stop the process or indeed work any benefit whatever, though in a large number of cases this effect is undoubtedly accomplished.

The beginning of sympathetic disease is usually slight and insidious, though occasionally it is ushered in by a violent and uncontrollable outbreak, which goes on rapidly to the destruction of the organ. In most instances the first symptom is difficulty in using the eye for near work—"it tires easily"; this is soon followed by evanescent attacks of subacute inflammation with pain and slight tenderness, passing off on rest, and by the laity described as "taking cold;" the pain becomes more constant, the tenderness on pressure increases, flashes of light become troublesome. If the eye be now touched carefully with a probe around the cornea in the region over the ciliary body, an area of super-sensitiveness will be elicited, and it is claimed (Bowman) that this is always at a point corresponding to the initial seat of irritation in the other eye (exciter). While there may be a question of this occasionally, it is the fact sufficiently often to be the rule, and has its bearing in the consideration of the medium of transmission of the disease via the ciliary nerves.

In a case presenting the symptoms above described with the other eye lost from injury or certain forms of disease yet to be mentioned, it is the duty of the surgeon to advise, in the most unqualified manner, the enucleation of the blind eye. You appreciate that the symptoms enumerated indicate a condition of irritation only; there is as yet no impairment of the special and peculiar function of the organ; no actual loss of vision, and it is in this stage that we look for the best effect of the operation. In most cases, if the source of the irritation—*i. e.*, the blind eye itself—be now removed, we may reasonably anticipate a favorable effect on the sympathizing eye; the irritation subsides and the eye continues to perform its function without impairment.

This irritative stage is, however, usually short, a matter of days (although exceptional instances are on record where it has lasted months, even years), and it is more or less rapidly followed by a diminution of vision, the cause of which being recognizable in an organic lesion. This is usually an irritis of

the plastic variety, though it may be serous, or a cyclitis, or a choroiditis, or (very rarely) even a neuro-retinitis; in either case there is an actual inflammatory process with production of new-formed material; the condition has passed beyond the irritative stage and is now vastly more serious because of the intractable nature of the process set up. In plastic iritis the effusion of lymph goes on to the blocking up of the pupil, of the filling up of Fontana's space, to covering the lens, it drags upon the ciliary processes, invades the choroid, and terminates in detachment of the retina and disorganization of the vitreous. The serous iritis is liable to take on glaucomatous inflammation, with the degeneration so fatal to vision characteristic of this disease. The lesions of the choroiditis and neuro-retinitis are the effusion of plastic lymph in these structures. It is thus seen that, except in the last-mentioned disease, the sympathetic disease is an inflammation of the uveal tract to which the ciliary nerves are distributed and the distribution of the optic nerve in the sympathizer is almost never affected—indeed, it has been strenuously denied by some observers of large practice that a true sympathetic neuro-retinitis ever occurs, and they hold that this fact is an evidence against the optic nerve medium of transmission from one eye to the other, but when careful observers (E.G. Loring, Knapp, Kipp and others) state that they have seen the beginnings in this form, negative evidence goes for little except as to its infrequency. In the acutely inflammatory stage of the sympathetic disease the removal of the "exciter" is not so beneficial to the sympathizer, indeed, cases are unhappily frequent in which the operation has been positively harmful, adding fuel to an already flaming fire: and yet it is difficult, in view of the want of success of other means of combating the disease, to make up one's mind to decline to do the one thing that in an earlier stage has proved itself to be the most potent single remedy or procedure that we have for treating it. But we must wait until in some way, -and it is beyond the province of this paper to discuss how,—we have subdued the active process, when in period of quiescence to the sympathizer, the exciter may be removed in the hope of preventing another attack.

We must also bear in mind that in a very small number of cases (about 10 per cent.) the sympathetic inflammation may

come on after the removal of the exciter, and it was thought by a committee of the Ophthalmological Society of the United Kingdom, reporting in 1886 upon 200 cases of this disease, in about 2 per cent. in consequence of the operation, both eyes having been quiescent previous to the operation. While the large majority of cases are shown to be benefited by the excision of the exciter, there were a certain very limited number in which we must remain doubtful as to whether the operation was the best thing that could have been done.

The conditions liable to give rise to sympathetic ophthalmitis are as follows: I. Injuries. 2. Diseases. Of the injuries: a, lacerating or perforating wounds so severe that the ultimate result will inevitably be atrophy of the globe; b, the lodgment of a foreign body in the interior of the globe; c, a penetrating wound involving the ciliary region, i. e., the periphery of the iris, or ciliary muscle, in the cicatrix. Of the diseases: a, recurring or chronic irido-choroiditis, from whatever cause; b, atrophy of globe, following purulent keratitis or panophthalmitis, and in which ossific degeneration of the retina has taken place; e, atrophy of the globe, from any cause, with a painful ciliary region.

It must also be further borne in mind that in none of these conditions does time confer any immunity against sympathetic disease. So long as the irritation exists it is a menace to the other eye. I have had in my practice sympathetic disease starting up thirteen years after the receipt of an injury, and others have reported much longer periods.

There is considerable difference in liability to the disease in the various injuries and diseases. In the first place, this sequence is more frequent after injuries than non-traumatic diseases, and of the injuries nothing is so potent as the lodgment of a foreign body in the eye, assuming, of course, that the organ escapes the dangers of septic infection as the immediate result of the penetration. That septic infection or bacterial growth have nothing to do with the propagation of the disease, witness the frequency of sympathetic disease that follows the dislocation of a crystalline lens, whether accidental from a blow without rupture of the globe, or intentional, as in the operation for couch-

ing. A consequence so frequent that the operation has been abandoned.

The pain which comes from the intra-ocular pressure of a chronic glaucomatous degeneration is frequently so excessive as to justify the removal of the offending organ, other means for the treatment having failed.

Of late years the opinion has more than once been expressed that a glaucoma may be occasionally a sympathetic disease, i. e., the glaucomatous process in the second eye being aroused and caused by a similar process in the eye first affected. I fail to see more than a coincidence, i. e., the not altogether unusual appearance of glaucoma in the two eyes chronologically consecutive. The results of operative interference do not establish a prima facie case either, inasmuch as the gravity of the situation has uniformly induced a double operation, viz., the enucleation of the first-affected blind eye and the performance of an iridectomy on the other; and whilst the enucleation is entirely justified, indeed demanded, we are without data as to its actual value as a therapeutic procedure.

Various diseases of the eve leave the organ in conditions so inconvenient or repulsive in external appearance that the surgeon's aid is sought, for purely cosmetic purposes, to relieve the deformity which is at once unpleasant to the looker-on and a mortification to the patient. A suppurative keratitis has left a staphyloma of the cornea projecting so that the lids cannot close over it. A hydrophthalmia has resulted from an iridochoroiditis of intra-uterine or infantile life; it may be a uniform enlargement of the whole globe, or it may have caused scleral staphylomata of irregular shape around and behind the cornea; these are both disfiguring and (remotely) liable to set up a chronic irido-choroiditis, with sympathetic dangers. There may be a disfiguring opacity of the cornea without staphylomatous projection, and also in dermoid cysts of the conjunctiva covering the cornea. The question of enucleation of the globe comes up in all of these conditions. Are there, however, no procedures that may be substituted, and avoid so severe a mutilation? In the early days of modern ophthalmology, viz., the sixties, abscission of the anterior segment of the globe, more or less extensive, with stitching of the margin of the wound together (more or less

evisceration of the contents of the globe being an inevitable consequence), was frequently performed, the opinion being that by leaving a large part of the globe for the muscles to act upon. a freer movement would be communicated to an artificial eve placed over it, and the mutilation be less noticeable. As a matter of fact, however, the result is about the same—the sclera collapses later, the globe shrivels down to a mere knot, and the difference in motion is inappreciable; while sympathetic disease has occurred from the implication of the ciliary nerves in the cicatrix. One such case is enough to condemn the operation. The cosmetic advantage, if it existed, cannot be weighed in the balance against sympathetic dangers. My opinion is decidedly against any of these risky procedures. Enucleation of the misshapen eye, with the introduction of an artificial eye, is the only admissible operation. The modern expedient of tattooing a white cicatrix of the cornea without staphyloma has resulted in sympathetic disease.

The enucleation of blind eyes that are the seat of phosphenes so intolerable as to affect the mental calibre of the patient has been done; but, like so many operations undertaken to relieve a symptom of nerve irritation, with doubtful utility. It is quite as likely to be due to nuclear irritation as to peripheral. The case is usually better treated in some other way.

In regard to the enucleation of eyes only partially blind, it goes without saying that a condition of things which can allow it to be seriously contemplated must apply with greater force to eyes already blind. The chances of accident or independent disease to the remaining eye are sufficiently great to justify the statement that nothing short of the certainty of ultimate blindness to both, or of death, can permit one to consider such a procedure.

Most of the intra-ocular tumors are sufficiently dangerous to life to demand the removal of the organ in which they are contained as the only hope that can be entertained of successfully combating their lethal encroachment. They are of two classes: the granulomata and the sarcomata. The former are not usually suitable for surgical interference; the latter are. These are glio-sarcoma of the retina, and the sarcomas, melanotic or otherwise, of the uveal tract. They are frequently detected by

the ophthalmoscope (sometimes without) before they have entirely destroyed vision, and should be removed at the earliest possible moment; and while, if left until they penetrate the sclera and invade the orbital tissues, they almost surely recur and cause the death of the patient; their successful removal with the globe has demonstrated that the most malignant of growths are, in their beginnings, capable of safe and permanent extirpation. Three years ago next month I removed both eyes of a child of two and a half years of age for a glio-sarcoma in each, and the child is still living, well. and healthy. It is true that this case does not, accurately speaking, belong in this classification, inasmuch as the child was entirely blind; but, as it shows that a severe case can be saved, the application to one involving less is evident Before the penetration of the sclera they are veritably encapsulated and comparatively safe for removal; but no one can say how long they will remain so, as it is only a question of time as to when they will break through this barrier and generalize. I regard them as preëminently the most malignant growths that exist: hence the advice.

Extra-ocular growths are of greater variety of histological structure. Besides the dermoid cysts already mentioned, sarcomata of the orbital tissues in both children and adults, and carcinomata of the conjunctiva in adults, occur. The latter may be removed with the globe with a fair prospect of non-recurrence, if the growth has not already spread to the palpebral conjunctiva or beyond.

Sarcomata of the orbit, even when not attached to the globe frequently require its removal in order to get at the whole growth. These are very sad cases. The eye is perfectly good, and it is difficult to persuade the patient, or family, of the gravity of the situation until too late to secure immunity. Not only does the globe require removal, but the entire orbital contents must be extirpated down to and sometimes including the periosteum.

There still remains to discuss whether an eye which contains an appreciable degree of vision should be removed in order to avert a threatened or prospective attack of sympathetic disease in the fellow.

When we consider the extreme obstinacy of the sympathetic disease, its frequent steady progress to total blindness, under the best directed and most active treatment, it is a point of great importance to determine if it be not our duty to take every precaution against either the onset or the progress of the disease. It was to this class that Mauthner inveighed in the quotation given above and it is quite possible that some eyes have been unnecessarily removed for fear of something that was too remote. It is certainly unjustifiable to remove an injured but still seeing eye, though it may be an exciter of sympathetic disease. The result of the operation undertaken after the disease has begun has not been sufficiently successful in arresting the progress of the malady to warrant us in advising the operation, especially as there are many cases on record in which the little that remains of sight in the injured or exciting eye was all the patient had left after an attack of sympathetic ophthalmitis; the eye secondarily affected having gone on to total blindness, the primarily injured one keeping what it had, serving to go about with. The only condition in which I can regard the removal of a still seeing eye justifiable for fear of sympathetic disease is where the foreign body remains in the eye. In these cases the sympathetic disease is so certain to follow that I think I would prefer to take the chances of losing it in some other way.

EDITORIAL ARTICLES.

SCHEDE'S CASES OF SPINAL SURGERY.

We are indebted to Dr. Schede, of Hamburg, for the advance sheets of the *Annals of the Hamburg City Hospital*, containing a review by Dr. Rieder of the cases of spinal surgery treated in that institution for several years past.

The cases are naturally grouped under the heads of: 1. Injuries to the spinal cord without injury to the bony envelope; 2. Tumors compressing the cord; 3. Injuries to the spine treated without operation; and 4. Injuries to the spine operated upon.

A case of concussion of the cord, without fracture or dislocation of the vertebræ or laceration of the cord, represents the first class. This is of interest, because, like nearly all of the cases treated mechanically, the symptomatology is carefully reviewed and followed by the post-mortem findings. In this case there was pain on motion and pressure over the region of the cervical and upper dorsal vertebræ,—paraplegia of the lower, but motion in the upper extremities. All sensation of pain and of heat and cold was lost in the lower limbs, but was retained in the upper. The reflexes were not much exaggerated. There was incontinence of urine and of fæces, cystitis and involuntary twitchings of the legs.

At the autopsy, however, nothing was found except that the lowermost cervical and upper dorsal portions of the spinal cord were softened, diffusely gray, without any extravasation or degeneration to be made out even under the microscope. It was supposed that the softening might have been cadaveric, as, owing to an official inquiry into the cause of death, the autopsy was somewhat delayed. The vertebræ were intact and nothing abnormal could be found in the brain.

In the second case the symptoms were due to compression of the spinal cord by a tumor. This patient received an injury about two years before he presented himself for treatment at the hospital, by being run

over by a light carriage. He had a pleurisy as a result of this injury, but was perfectly well after his recovery from this attack until twelve weeks before coming under observation, when he began to complain of pain in the left side and back. His condition gradually grew worse, motion in the upper extremities remaining free, but he could only rise from the bed with severe pain; walking became difficult and he was unable to raise the balls of the great toes from the floor. He also had girdle pains, anæsthesia in both feet, diminished sensibility in the lower extremities and abdomen, both for pain and temperature, especially the latter. Patellar reflexes were retained and easily called forth. Finally, all voluntary control over the lower limbs was lost and there was flexor contraction in the right leg and extensor contraction in the left. Sensation to pain was still present, but the sensibility of the back was diminished. Jarring the vertebral column caused great pain, and a slight deviation from the normal curve of the spine was present in the lower dorsal region. Analgesia of the abdomen finally extended up to the seventh rib in front and in the back as high as the twelfth dorsal vertebra, and the reflexes gradually disappeared. Incontinence of urine with cystitis set in; there were also frequent involuntary convulsions in the lower limbs causing great pain in the back. A course of treatment by Koch's lymph was without result. Four months after his admission to the hospital a flat swelling, like a fungous suppuration and suggesting vertebral caries with compression myelitis, being made out, operation was determined upon. The spinous processes of the mid-dorsal vertebræ were destroyed and replaced by a vascular tumor of about the size of a child's head, which extended into the muscular structures on both sides of the vertebral column. Extirpation being impossible, it was removed as thoroughly as possible with a sharp spoon and cauterized with the Paquelin cautery. The tumor proved to be a small, round-celled sarcoma. No improvement resulted from the operation.

The second case was in a girl six years of age who was admitted to the hospital March 12, 1892, on account of paraplegia of both legs and multiple bed sores in the lumbar and dorsal regions. These symptoms began only six weeks before admission, with severe pain in both arms, but no paralysis. A complete

paraplegia of both legs occurred suddenly about four weeks after the onset of the symptoms. There was observable, on the right side and along the dorsal vertebral column, a pseudo-fluctuating tumor the size of a hazel nut over which the skin was freely moveable. The arms were not paralyzed. Slight motion in the left psoas muscle and a slight flexion of the right foot was possible. Electric excitability was diminished, but no reaction of degeneration was present. Sensibility was retained. The rectum and bladder were completely paralysed. There were gangrenous bed-sores penetrating to the bone on the left iliac crest. General condition was pretty good. Good appetite, no pain, no temperature.

An incision about 12 cm. long on the right side of the dorsal column was made. A round tumor was present on the right side at the point of transition from the arch to the costal insertions; a process of the tumor extending downward. The tumor masses outside the vertebræ having been removed, a cord was seen leading into the vertebral canal. The arch of the second vertebra, whose spinous process was exposed, was removed. The spinal cord having been laid bare, a distinct difference in level was noticeable. The first and third vertebral arches were removed for the purpose of extirpating the masses attached to the dura; the first being removed because there was a lateral process of the tumor. There existed under the third vertebral arch a flat formation, covering the entire dorsal surface of the dura mater. A continuation of the tumor masses towards the anterior surface was not noticeable. Operation had to be speedily terminated in consequence of collapse.

Patient complained of incessant pain and needed a great deal of morphine after recovery from the operation. The wound looked well, three days later the level of the dura was everywhere the same.

The ulcerations on the back looked well; those above the left trochanter (which were very deep) had begun to clear up. Legs apparently not atrophied; sensibility retained; slight cedema of both feet; the flexors of both extremities worked well; there existed little capacity for motion except at the tarsal joints, particularly at the right, affecting mainly the flexors of

the toes; extension, both of feet and thighs, was very feeble.

No reaction of degeneration. Scarcely noticeable diminution of constant faradic excitability. Reflexes considerably increased. Rectum and bladder paralyzed.

No change in retained sensibility and the extinct functions of rectum and bladder. Patient can perform flexion, though rather slowly and uncertainly because the intercurrent reflex-movements are disturbed. Plantar reflexes of both feet not improved and still restricted to uncertain movements of the toes. Quicker and surer flexion of the left leg than of the right. Extension of left leg is possible from time to time, but proceeds quite slowly and with visible exertion, the heel being gradually advanced on its support. The falling over of the leg being, sometimes, prevented with difficulty. It is impossible to undertake rotation and movements of abduction and adduction in the thighs. The patellar reflexes are greatly increased on both sides. Very pronounced ankle-clonus.

Electric attitude the same as before the operation.

The paresis of the radialis made but little progress. The muscles of the back of the hand became very atrophic; very distinct depressions between the metacarpal bones. The ball of the thumb has become atrophic. Opposition of the thumb impossible; only slight ability of extension; abduction and adduction entirely absent. Extension of fingers succeeds only at times and imperfectly. Extension in wrist (dorsal flexion) very imperfect. Abduction of small finger possible. Sensibility of back of the hand undisturbed.

Difference between right and left arms at wrist: R. 10 cm., L. $10\frac{3}{4}$ cm.

General condition excellent. Patient has appetite, does not cough. (This was a manuscript report of a case operated upon in March of this year).

In another case there was an extensive laceration of the cord following a fall of about fifteen feet, striking upon the head and resulting in paralysis.

This patient had violent pain in the neck which seemed shortened from above downwards; there was extreme sensitiveness to pressure over all the cervical vertebræ, but no demonstrable dislocation or crepitation. Paraplegia and anæsthesia of both lower extremities. The anæsthesia extended over the whole trunk up to the cervical vertebræ with decreased sensation of the upper extremities and loss of muscular strength, although motion was still retained. In twenty-four hours collapse accompanied by unconsciousness, marked meteorism, dyspnæa and death. On autopsy a rupture of the ligaments between the vertebral arches of the first, second, fourth, fifth and sixth cervical vertebræ with anterior luxation of the sixth and posterior dislocation of the seventh cervical vertebra with rupture of the inter-vertebral cartilage were found. The cord was lacerated between the third and seventh pairs of cervical nerves, and there was hemorrhage into the vertebral canal.

FRACTURES OF THE SPINE.

I. Cases Treated Without Operation.

Twelve days before coming to the hospital a patient while bathing jumped headlong into the water, supposing it to be of considerable depth. He struck the bottom, as he says, on his neck, and was at once completely paralysed from the neck downwards, but not unconscious. Vomited repeatedly after the accident and had difficulty in swallowing. Also had several attacks of dyspnea, speech unchanged. Bowels were moved by clyster after being confined for nine days, but afterwards incontinence of fæces and urine. For eight days there was slight motion in the hands. No lesion about the head. decubitus. Slight prominence of first dorsal vertebra, which was also very sensitive to pressure. Complete motor and sensory paraplegia of the trunk and lower extremities, and only a slight raising of the hands and stretching of single fingers possible; slight sensation upon deep needle puncture, in the ulnar region. Skin reflexes of both feet and hands retained. Respirations diaphragmatic, the thorax being quite immovable. Sudden and severe attacks of dyspnæa finally set in a short time before death.

At the autopsy the cervical vertebral column was found to be abnormally mobile. The fifth cervical vertebra was slightly prominent and an irregularly triangular piece of bone was blasted off and connected with the sixth vertebra only by the intervertebral cartilage.

The cervical cord was extremely soft and sunken in the region of the fourthand fifth roots. A cavity, limited by the pia mater anteriorly and by a thin layer of cord tissue posteriorly, filled with necrotic shreds, partly still connected and partly already loosened from their surroundings, was found.

This area of softening measured 2.5 cm, in length and was between the fifth and sixth pairs of cervical nerves. Cord above and below, normal,

The second case fell fifty feet from a roof and received a fracture of the fifth and sixth cervical arches, with dislocation of the sixth cervical upon the seventh. There was a slight extravasation in the dural sac in the cervical and dorsal regions and complete destruction of the cord between the fourth and seventh cervical nerves. Comminuted fracture of right humerus. This patient had paraplegia and anæsthesia of both lower extremities; anæsthesia of the trunk anteriorly as high as the sixth rib, posteriorly below the fourth dorsal vertebra. The upper extremities were not paralyzed, although the muscular power was greatly reduced. No disturbances of sensibility in these limbs. Patellar reflexes weak; incontinence of urine and fæces; slight priapism.

The third case had a circumscribed fracture of the sixth cervical vertebra. Chipping off of a lamella from the anterior circumference of the vertebral body caused a wedge-shaped compression of the spinal cord. This case had motor and sensory paraplegia. Anæsthesia extended up to the mammary line. Motion in the arms was slightly diminished; sensibility retained; incontinence of urine and fæces; marked meteorism.

In the fourth case the injury consisted of a complete crush of the body of the sixth cervical vertebra, but the ligaments between the vertebræ were not lacerated. Cervical medulla from the point of fracture up to the third cervical vertebra was changed into a white paste in which white and gray substances could no longer be distinguished. The rest of the cord was soft, but free from foci. Total obliteration of the right pleural cavity. The symptoms in this case were: violent pain in the neck which could not be exactly located; no particular sensitiveness to touch along the vertebral column. Com-

plete paralysis of both lower extremities and abdomen. Anæsthesia extending up to the lower edge of the third rib anteriorly, and to the third dorsal vertebra posteriorly.

Motor and sensory paralysis of the right forearm in the region of the ulnar nerves, motor paralysis of the whole left forearm, permanent priapism, total paralysis of bladder and of bowels. There was a constant turning of the head to the left. If turned straight it returned at once to its former position, difficult breathing (Cheyne-Stokes?) and at the last clonic-tonic convulsions in the left arm.

In the last case of this series the patient was injured by being bent backwards, falling to the ground paralyzed in both legs. There was slight tenderness on pressure over the 6th and 7th cervical vertebræ, fracture of the 6th and 7th cervical vertebral bodies, with rupture of the ligaments and a crushing of the spinal cord in this region. He had loss of motion and sensation in the lower limbs and the anæsthesia extended up to a line somewhat above the nipples. Reflexes increased; rectum and bladder paralyzed.

There are seven cases of fracture of the dorsal vertebræ. In the first case a transverse fracture and dislocation backwards of the body of the twelfth dorsal vertebra existed with total paraplegia and anæsthesia of the legs and trunk up to the umbilicus, retention of urine and obstipation, extravasation of urine. This patient lived six months; at the autopsy an ascending degeneration of the columns of Goll, and chronic myelitis and atrophy of the lumbar cord were found.

The second had a fracture of the dorsal body with posterior dislocation of the lower fragment and a fracture of a piece from the posterior part of the body of the eighth, with complete destruction of the cord at the seat of injury. He had complete paraplegia and anæsthesia of the lower extremities; reflexes absent; incontinence of urine and of fæces; cystitis.

The third died immediately after admission to the hospital; he had complete paraplegia and anæsthesia of the lower extremities and of the trunk up to the 5th dorsal vertebra; retention of urine. Reflexes absent. Cerebral hemorrhage, crushing of 5th dorsal, and mul-

tiple other injuries. Spinal cord torn across at the seat of the spinal injury.

In the fourth case there was complete paraplegia in both legs and almost symmetrical anæsthesia on both sides as high as the umbilicus. Painful swelling in the region of the 5th, 6th and 7th dorsal vertebræ, occasioned by the protrusion of the spinous processes of those vertebræ. Paresis of bladder, obstipation. The 9th dorsal body was fractured and a wedge-shaped piece was dislocated into the vertebral canal, so that the spinal cord was completely severed and the canal completely blocked.

The fifth case was one of direct violence, being struck in the back while lying on the ground. He suffered a fracture of the sternum and of the 4th dorsal vertebra, which was dislocated backwards contracting the lumen of the canal. At this point the cord was softened. This patient had paralysis of the lower extremities, bladder and rectum.

Sensibility completely lost on the left side up to a hand's-breadth above the knee, on the right up to four fingers' breadth above it. It was weak from this point up to a line running transversely the breadth of a hand below the nipples. Under extension and counter-extension the anæsthesia finally disappeared down to the soles of the feet but finally increased again together with paralysis of the rectum and bladder and disappearance of the patellar reflexes and bed sores.

The sixth case had a fracture of the 8th and 9th dorsal vertebræ. His right leg and arm were paretic, sensibility normal. Left extremities normal. Reflexes normal. Bladder paralyzed. After the application of a plaster jacket the bladder paralysis disappeared; right arm also recovered and leg greatly improved. Obstipation. This patient was dismissed from the hospital greatly improved.

In the last case no autopsy was allowed.

There is but one case of fracture of the lumbar vertebral column.

This case was brought to the hospital four weeks after his injury.

He was said to have become immediately paralysed after a fall of about 20 feet and sensation was said to have been absent up to his knees.

Paraplegia and anæsthesia as high as Poupart's ligament, sensi-

bility of penis and scrotum greatly reduced. Reflexes absent. Incontinentia urinæ et alvi—gibbossity at first and second lumbar. Bedsores. No autopsy.

II. Fractures of the Vertebral Column Treated by Operation.

1. Man. Twenty-four years of age; fell from a wall on his back and was rendered unconscious; when admitted to the hospital he was suffering from shock and had rather copious bleeding from the left ear. No external injury of the cranial arch. Fracture of the fifth and sixth dorsal vertebræ with a pronounced gibbosity. He had complete paraplegia and anæsthesia from the umbilicus down. Paresis of bladder, reflexes increased. Treated by extension and counter extension, and finally plaster corset. Under this treatment there was a progressive increase in the symptoms, and consequently about one year after the accident the fifth and sixth spinous processes and vertebral arches were resected.

Some fragments of bone were found pressed in upon the spinal cord, and they were removed. No injury to the dura or to the cord itself could be made out. No improvement followed the operation, and he died about one year later, two years after the accident.

Autopsy, multiple bedsores, defect of the spinous processes and vertebral arches of the fifth and sixth dorsal vertebræ. Vertebral canal closed by fibrous tissue. Consolidated fracture of the bodies of the seventh and eighth dorsal with the formation of a gibbosity. The spinal cord was compressed at this point. Its structure on section was not recognisable. Brain normal.

2. Man. Thirty-eight years old, was struck on the left shoulder by a heavy block of wood which had fallen from a considerable height. Anæsthesia of both legs and trunk up to four finger's-breadth below the nipples. Paraplegia, paralysis of bladder and rectum. Treated by extension; about ten days later the patient could move the toes of the right foot slightly and had very slight power of rotation, hyperæsthesia. Plaster jacket applied. About two weeks after this he complained of increased pain in the left leg and arm, reflexes were increased and there was a bed sore beginning over the sacrum. After another

month there was slight improvement in all the symptoms, and another month later he was able to raise the entire leg for the first time.

At the end of the year his condition had become worse again; both legs were spastic, flexion and adduction at the hip-joint, "drop-foot." A slight motor paresis of the shoulder was noticed and difficulty in supinating the forearm. Sensibility about normal. Reflexes increased except the abdominal and cremasteric reflexes which were only indicated. Kyphosis about the middle of the dorsal column. Scoliosis, toward the left of the lower dorsal column.

After careful electrical treatment no improvement,

Operation January 6, 1888, one year and three months after the injury. Four spinous processes and arches were removed in the middle of the dorsal region by means of the chisel and mallet. The spinal cord was almost completely destroyed, the fractured body of the sixth vertebræ being pressed into the canal. There was an increase in the spastic symptoms lasting for some days after the operation. No improvement.

3. Man, thirty-four years old, was brought to the hospital unconscious, having fallen two stories on to a slate roof and then to the ground. No vomiting, no bleeding.

Complete paraplegia and anæsthesia of lower extremities. Patellar reflexes absent; region of the 5th and 6th dorsal vertebræ prominent; priapism; bladder distended with urine; trace of albumen; dislocation left humerus easily replaced; extension.

Next day, condition much the same. No sensation up to the middle of the abdomen. Beginning bedsores over gluteal regions.

Sixteen hours after accident, operation under chloroform—morphine narcosis.

An incision 15 cm. long made over the spinous processes of the 5th and 6th dorsal vertebræ in correspondence with the prominence of the vertebral column. The spinous process of the 5th vertebra was found fractured and easily removed. The arch of the sixth vertebra was fractured in its posterior section, both transversely and laterally. Whilst, however, the fracture line on the right side runs past the processus transversus nearly straight from below, that of the left side falls nearly into a direct prolongation of the fracture line running

transversely, so that to the left another piece of the transverse process is broken off. The joint surfaces of the 7th vertebra are attached to the fractured piece, while those of the 5th remain intact.

The ligaments, especially the interspinous, are torn, the fractured piece itself and with it the whole posterior segment of the vertebral column is driven into the vertebral canal and materially decreases its lumen. Another rotation of the fragment has apparently taken place in such a way that the spinous process has advanced under the skin and the upper portion of the fragment is driven in an opposite direction towards the canal lumen. It is this upper part that lies on the cord and compresses it. The fractured arch is raised with Langenbeck's hook, completely detached and extracted. The spinal cord then lies free surrounded by an uninjured dura. It seems, at the point of pressure, to be softer than normal and to have some fluctuation.

Open wound treatment.

Operation well borne. Slight increase in symptoms. Galvanic and faradic excitability retained.

Two days later symptoms began to improve.

There are still phenomena of tension in the muscles on passive movements. Loud snowball-grating in flexion of knee, more L than R, also fibrillary spasms in region of rectus femoris vast. int.

Patellar clonus, R and L, even at mere knocking at tendon.

Ankle-clonus at right during passive dorsal flexion; hardly any at left.

Skin reflexes at lower extremities hardly increased. Foot sole reflex greatly increased at L, the whole extremity responding violently; less intensely at R. Intensity of reaction gradually disappearing on continued irritation.

Sensibility not changed; impression to temperature normal; functions of bladder and rectum normal; urine normal. Patient walks about without support and without complaint. A smooth, solid scar is found in back corresponding to operation wound. A sulcus of skin corresponding to defect of proc. spinosi, allowing insertion of a finger. Appearance excellent; nutrition very good; increase of weight steady, 59.8 kil. on Oct. 7, 1890, 74 kil. on Nov. 1, 1891,

complexion florid. Patient is on his legs all day and can now walk for two hours without fatigue or trouble. Patient is discharged Nov. 4, at his own request. He enjoys at home excellent health according to a letter written by him in January, 1892.

These cases have been given somewhat in detail because they represent careful observation of symptoms followed by the postmortem observations, and, therefore, have a direct bearing upon the study of the symptoms of localized injuries of the spinal cord and the probability of their improvement by operation.

A recent paper by Dr. M. Allen Starr, in the Amer. Jour. Med. Sciences, July, 1892, on "Local Anæsthesia as a Guide in the Diagnosis of Lesions of the Lower Spinal Cord," is of interest in this connection:

"First, as to the location in the spinal cord of the centres of control of the bladder and rectum. These centres appear to be uniformly affected together, and, therefore, must be adjacent to one another. The control of the sphincters is lost when the lesion involves the lower three sacral segments, and the centres probably lie in the lower two segments of the cord. • This is proven by the autopsies in the cases of Kirchkoff, Westphal, Oppenheim and Herter, and by the distribution of sensory symptoms in two of my cases, and in those of Rosenthal, Bernhardt, Eulenberg, Mills, and Huber. In these cases without autopsy the situation of the anæsthesia was such as to show that the lesion was limited to the two or three lower sacral segments, and in all the control of the sphincters was lost.

"When these segments are destroyed, the sphincter of the rectum is relaxed and there is no opposition to the introduction of the finger into the anus. The entire rectum also loses its power of contraction so that it is only emptied by pressure from above or by artificial evacuation by means of enemata or excavation.

"The sphincter of the bladder does not appear to be permanently relaxed when the cord is destroyed. At any rate a constant dribbling of the urine rarely, if ever, occurs. There is, however, a moderate incontinence, for as soon as a few ounces of urine collects in the bladder the pressure overcomes the slight resistance of the sphincter and the urine flows away. Hence a frequent emptying of the bladder without the knowledge of the patient takes place. There is rarely a

sufficient resistance offered by the sphincter to cause a retention of urine and distention of the bladder when the lesion destroys the bladder centres. This is much more liable to occur when the lesion lies at a somewhat higher level in the upper sacral region and produces an irritation of the mechanism of the bladder. It seems to occur also when the lesion involves the cauda equina, producing pressure on the nerve roots. Since pressure upon a nerve elsewhere never produces tonic spasm, this effect must be of a reflex nature from compression of the sensory filaments.

"If, in a case of paraplegia, the mechanism of the bladder and rectum is not interfered with—if these organs empty themselves naturally when full—in spite of or without the knowledge or control of the patient, it is a proof that the lesion has not destroyed the lower sacral segments of the spinal cord. In such cases the exact area of anæsthesia should be carefully determined, for the information thus afforded may enable an exact diagnosis of the situation of the lesion and also of the actual extent on the cord to be determined.

"Secondly, as to the distribution of anæsthesia in lesions of the lower part of the spinal cord. In the back it is possible to outline seven concentric zones of anæsthesia, starting from the lowest part of the sulcus between the buttocks as a centre.

- "I. The *first zone* is oval in shape, small in extent, and includes the perineum, the posterior part of the scrotum in males, the vagina in females; it also includes the mucous membrane of the rectum.
- "2. The second zone is heart-shaped—point up—and includes the entire scrotum and posterior surface of the penis and mucous membrane of the urethra in males—the entire genitals of the female, except the outer surface of the labia majora and the mons veneris.

"These two zones can be separated clinically, for in some cases the smaller zone only has been anæsthetic. In the majority of cases the larger zone has been found anæsthetic. No autopsies are at hand to enable a distinction of lesion to be made between these two zones, but from the cases of Kirchkoff, Westphal, and Herter it is possible to affirm that the second zone is produced by a lesion involving the conus medullaris and the fifth and fourth sacral segments of the cord.

"3. The third zone is considerably larger, involving a greater sur-

face of the buttocks and extending down the back of the thighs over a triangular area, point down. This has been named the "saddle-shaped area," coinciding about with the surface of the seat in contact with the saddle when riding. A zone of anæsthesia of this shape is due, as the autopsy in Oppenheim's case shows, to a lesion involving the fifth, fourth, and third sacral segments.

"4. The fourth zone is of a similar shape to the third, but more extensive, a greater surface on the back of the thighs being involved, and the anæsthesia extends in a band almost as low as the popliteal space. This area has been established clinically in several cases: there is as yet no autopsy to determine its lesion; but since the smaller zone is due to lesion at the third sacral segment, and the next larger zone is due to a lesion in the fifth lumbar segment, it is allowable to conclude that this region corresponds with the second and first sacral segments.

"In thus outlining four zones of the skin and assigning them to various segments of the sacral portion of the spinal cord, it is not my intention to lay down artificial boundaries or to affirm that all cases will exactly coincide. The lesions in the sacral cord are not limited exactly to one or two segments. The sacral cord is small in extent and lesions involve it to a greater or lesser degree, consequently these zones are not always symmetrical on the two sides of the body; the lesion being a little higher on one side of the cord than on the other, the zone of anæsthesia will be greater on one thigh than on the other, I only wish to show that as the cord is invaded by disease from below upward, the area of the skin which becomes anæsthetic increases in extent, and that the shape of the area is characteristic; so that from the study of the area the extent of the lesion can be determined.

"I also desire to call attention to the fact observed in my fourth case, that this area of the skin which corresponds to the sacral cord may remain sensitive in a lesion of the lumbar cord, when that lesion is so limited in extent as not to cut off impressions passing from the sacral cord to the brain. This affords an important evidence of the extent of a lesion in the lumbar cord. For if that lesion is transverse

and involves all the columns, all sensation below its level will be lost, while, if the lesion is limited and does not affect the posterior columns of the cord through which impulses are passing up from the sacral region, the total anæsthesia will not include the parts of the skin related to the sacral cord.

- "5. The fifth zone of anæsthesia is seen to include the first four zones and to extend down the back of the thigh through the popliteal space in a band, and then to descend the outer surface of the leg to the foot. In some cases it ends at the ankle, in others it involves the entire side of the foot, dorsum, and sole, and three and a half toes. When a lesion extends from the sacral into the lumbar cord the anæsthesia extends from the thigh down the outer side of the leg. This area then corresponds to the fifth lumbar segment of the cord.
- "6. The sixth zone of anæsthesia is produced by a lesion of the third lumbar segment. When the third lumbar segment is diseased, the entire back of the thighs and legs is anæsthetic and the front of the thighs is also anæsthetic, except over a funnel-shaped zone which extends from above downward, the narrow tube of the funnel reaching along the shin even to the foot. This zone will probably be separated later into two separate parts corresponding to lesions of the fourth and third lumbar segments. There is not as yet a sufficient number of cases to warrant such a distinction. The exact limits of anæsthesia on the feet are still uncertain, and no more exact statement than that given is warranted. It is quite common to find the inner arch of the foot sensitive when the toes and heel and entire dorsum are anæsthetic, and it is probable that the higher the lesion the greater the anæsthesia on the foot.
- "7. The last and largest zone of anæsthesia is produced by a lesion of the four lower lumbar segments, that is, by destruction of all but the first lumbar segment of the cord. The line of anæsthesia is much lower in front than behind and follows the line of Poupart's ligament. It is only when the first lumbar segment of the cord is invaded that the abdominalwall becomes anæsthetic.
- "From this level upward the zone of anæsthesia extends around the body in a girdle, and there is no difficulty in locating the level of the lesion in the dorsal cord.

"It is to be remembered that in all these lesions and areas of anæsthesia, the anus, perineum, and the genitals are included in the insensitive region. This is an important fact in the differentiation of cases of organic from functional paraplegia. It is also to be noticed that the shape of the area of anæsthesia in the back differs in organic and in functional cases.

"The escape of the genital organs in the functional cases is a most important point of diagnosis between hysterical and organic paraplegia.

"The study of the area of anæsthesia, therefore, not only enables us to reach a diagnosis of the level of the lesion; but it also enables us to separate organic cases of spinal-cord disease from functional and hysterical cases of a paraplegic kind.

"Multiple neuritis is sometimes attended by anæsthesia of the extremities. The anæsthesia is limited, however, to the hands and feet, or if it extends up the limbs it is limited by a line drawn around the legs or forearms below the knees or elbows. It never resembles in its distribution the area of anæsthesia produced by lesions of the spinal cord.

"Nor can the anæsthesia from injury of special nerve trunks be confounded with that due to spinal disease, as a reference to any diagram of the distribution of the cutaneous nerves will show.

"A few words must be added regarding the differentiation of lesions of the spinal cord from those of the cauda equina. The study of the anæthesia alone does not aid very greatly in the differentiation. A lesion of the sacral nerve roots produces an identical area of anæsthesia as a lesion of the sacral cord. It also produces a paralysis of the bladder and rectum. Thorburn¹ has proved that pressure exerted on the cauda equina affects the nerves in the middle of the cauda to a greater extent than those near the surface. 'Those nerves which pass out lower down are, in the cauda, situated nearer the middle line than those which pass out above them, and hence they would appear to have more room to escape from pressure, and we might expect them to suffer less rather than more; but that the con-

¹ The Surgery of the Spinal Cord, p. 99.

trary is the case is an established fact, and we are able definitely to conclude that in a pressure lesion of the entire cauda equina those nerve roots which emerge lower down are more seriously injured than those above them.' This conclusion has been proven by the autopsy in Herter's case, where the middle roots only were degenerated, though the pressure was exerted on all the roots at the level of the last lumbar nerve.

"There is no way, therefore, of determining by a study of the anæsthesia alone a pressure lesion on the cauda high up from a destructive lesion in the cord at its lowest extremity.

"The diagnosis may, however, be made, first, from a study of the surgical indications, chiefly of the nature of deformity, the relation of the vertebræ to the segments of the cord being remembered. The cord ends at the first lumbar vertebra, hence any fracture below that is necessarily compressing the cauda equina. Secondly, the diagnosis may be made from a study of the paralysis which accompanies the anæsthesia. This paralysis is very slight in lower cord lesions, being confined to the peronei muscles when the lesion is at or below the second sacral segment; it involves the anterior tibial and posterior tibial muscles when all the sacral segments are involved, and only invades the movements of the hip-joint when the entire lumbar region of the cord is affected. In cauda lesions, on the other hand, the pressure on the nerve roots is often sufficient to produce widespread paralysis when sensation is but slightly affected.

"The cases in which autopsy or operation has revealed the nature of the lesion in diseases of the lower cord demonstrate, however, that a sharp differentiation between cauda equina and cord lesions is not often justifiable. In the four autopsies here cited, both cord and cauda were invaded by the lesion, which was a meningo-myelitis with hemorrhage, the result being a destruction of the lower cord and a matting together of the nerves of the cauda in a mass of inflammatory material. It seems, therefore, questionable whether, except in cases of fracture below the first lumbar vertebra with displacement of the vertebræ, any sharp line of distinction between cord and cauda lesions should be attempted. It is chiefly in the surgical cases that operative interference has been attempted, and here, as already

stated, the surgical rather than the medical facts have been the surest guides to the operation.

"There is one case on record, however, of successful operation for removal of a tumor compressing the cauda equina (Laquer, Neurol. Centralbl., 1891, x. 193). In this case the extreme pain in the sacral region and the tenderness over the sacral region appear to have been the particular symptoms which guided the operator; the tumor was extra-dural, and the nervous symptoms were by no means such as to suggest a lesion of the spinal cord. In two other cases of tumor of the cauda equina—viz., those of Simon (Arch. f. Psych., 1875) and Lachmann (Ibid., 1882), the characteristic nervous symptoms of compression of the cauda were wholly wanting, and the cases were not diagnosticated during life.

"Some writers upon the differential diagnosis between cord and cauda equina lesions have laid stress upon the fact that sensations of touch, temperature and pain are not always equally destroyed, and have sought to conclude that this inequality of sensory disturbance was evidence of cord lesion as distinguished from cauda equina lesions. The cases of Herter and Oppenheim, with autopsies, and two of my cases, in which the operation showed the lesion to be a compression of the cauda without lesion of the cord, prove that this point of differential diagnosis is not well taken. In both cord and cauda lesions the disturbance of tactile sense may be more or less extensive than that of the sense of pain and temperature.

"It is evident from the facts here presented that a careful study of disturbances of sensation is a valuable aid in the diagnosis of the situation of lesions in the spinal cord and cauda equina. It is, however, to be remembered that anæsthesia is but one of a series of symptoms entering into that diagnosis, and the condition of reflexes, and the power, tone and electric reactions of the muscles are not to be neglected in the examination of any case. It is only when all the signs of a local lesion coincide that the diagnosis is an absolute one."

Comparison of Results Obtained by the Conservative and Operative Methods.

In the former series there are thirteen cases—five in the cervical

region, seven in the dorsal, and one in the lumbar. Of these all died excepting one of the dorsal cases, in which there was decided improvement and in which Sayre's plaster jacket was employed.

All the cervical cases resulted from indirect violence, and in four there was complete destruction of the spinal cord at the point of injury. In the third case, however, there is no record of destruction of the cord, but a simple compression by a wedge-shaped piece of bone. The symptoms, however, pointed to a rapid upwards involvment of the cord as high as the phrenic origin, and finally respiratory symptoms were very marked. He lived only four days, and it is not at all likely that operation would have been of any benefit.

In the dorsal cases the first patient lived six months, and at the autopsy an ascending degeneration of the columns of Goll, chronic myelitis and atrophy of the lumbar cord, would seem to indicate that, had an operation been performed early, some benefit might have been obtained. In the second and fourth cases the cord was completely destroyed, the third died immediately after his admission to the hospital, and the fifth was one of direct violence, who improved decidedly for a time by means of extension and counter-extension, and in whom it is possible that an operation might have arrested the alteration in the cord. The sixth case left the hospital greatly improved, the only one of this series who did not succumb to his injuries. In the last caseand in the lumbar case there was no autopsy allowed.

In the operative series there are only three cases with one death, one unimproved and one improved. In the case that died the autopsy showed that the cord had been completely destroyed and the canal blocked by a fibrous mass; he was not operated upon until about one year after the accident.

The second case first improved, then became worse under the extension treatment, and was operated upon a year and a quarter after the injury. His symptoms were increased for a time after the removal of the arches, which was done with the mallet and chisel, a fact that has been noticed in other instances, where this method of operating has been employed but finally there was no improvement in his condition. The last case was operated upon sixteen hours after his injury and a compression of the cord was found and removed. He made an absolute recovery.

In considering this tabulation of cases the conclusions are stated as follows:

Considering the distressing prognosis of such lesions in the cervical region and our absolute inability to render assistance, a bloody operation appears plausible.

In the dorsal region autopsy having shown that a depressed fragment had caused either a softening process in the neighborhood of the compression, or more frequently, that compression of the medulla produced a cord degeneration, an irreparable change of the cord was noticeable wherever the narrowing factor was not removed. Recovery in the last case operated upon was solely due to operation directly after the accident.

The methods of treating vertebral fractures in the usual way offer a chance of success only where there exists no, or but slight, disturbance of the spinal cord, such as paralysis of single groups of muscles, one-sided paralysis, partial disturbances of sensibility, etc.

But in all cases where paraplegia, total anæsthesia and paralysis of the bladder and rectum indicate a severe alteration of the cord, only an operation, directly after determining the point of fracture by means of local symptoms, will afford a chance of attaining an improvement, approaching a cure in favorable cases.

These cases illustrate very forcibly the fact that if any benefit is to accrue from operative interference in this class of cases, it should be undertaken early, before degeneration due to compression has advanced and destroyed all hope of improvement. The operative cases also show that the results derived from a careful study of the symptoms have not yet advanced far enough to enable us to differentiate absolutely between a complete destruction of the cord, and a simple arrest of its function in consequence of compression. These cases only emphasize the conclusions we advanced after a study of one hundred and three cases a year ago. ¹

There are also eight cases of operation for paraplegia of Potts' disease, which we have not given in detail as they will appear in an article on that subject in the October issue of the Annals.

SAMUEL LLOYD.

¹American Journ. Med. Sciences, July, 1891.

KUEBLER ON EXTIRPATION OF ANEURISMS.1

E. Kuebler, in a paper on "Extirpation of Aneurisms," gives the history of 40 cases—28 arterial and 12 arterio-venous aneurisms; of these, 11 were idiopathic and 29 traumatic.

They were classified as follows:

		Arterial Aneurisms.	Arterio- venous A.	Total.
Femoral		3	2	5
Popliteal		5	5	9
Post. tibial	4 9	1	1	2
Ant. tibial		1	0	1
Dorsalis pedis		1	0	1
Axillary		1	I	2
Brachial		6	2	8
Ulnar		4	0	4
Radial		1	0	1
First interosseous, dorsum of hand.		ĭ	0	1
On head		2	2	4
Orbital		1	0	1
Tongue		1	0	1
		28	I 2	40

Size. One of the aneurisms of the brachial artery reached the size of a man's head, two that of a child's head, the remainder varying from the size of a pigeon's to a hen's egg.

Those of the popliteal artery varied from the size of a hen's egg to the size of both fists.

The femoral aneurisms from the size of a hen's egg to a goose's egg. Those of the smaller arteries ranged from the size of a hazelnut to a hen's egg.

In three of the forty cases we had to deal with ruptured aneurisms.

Eleven of the cases had been treated unsuccessfully by the various modes of pressure; five by Hunter's method of ligation.

¹Beitrage zur Klinischen Chirurgie.

Thirty-nine of the forty cases were successfully treated by extirpation.

In three cases of aneurisms of large vessels operated on in preaseptic days, the convalescence did not last over four weeks.

In a considerable number of the cases primary union took place, and after operation for smaller aneurisms this invariably was the result.

In two cases suppuration took place; one case was complicated by a gun-shot injury (Félizet); in the other a portion of the sac was retained and was later cast off (Despres).

One case of aneurism on the head died from hemorrhage (Socin).

The possibility of extirpation of traumatic aneurism is well shown by the twenty-nine cases cited. Trendelenberg operated on a case following an injury received six days previous.

There are also cases operated on, one of four weeks' standing, three cases of five weeks, and two after six weeks.

As regards technique, two methods were employed.

In the first the exposed sac is incised, emptied, the ends of the vessels tied and the sac extirpated. In this method the excision is difficult, and often portions of the sac are left behind.

The second method seems to be of more value; the sac is extirpated without being incised.

The proximal end is laid free and the vessel ligated. The sac is then dissected outwards; after shelling out of the sac the distal end of the artery is tied. In some cases it is advantageous to begin dissection at the distal end.

The first method is preferable in femoral aneurisms when there is danger of hemorrhage from the profunda; also when it is difficult to get at the vessels, or when profuse hemorrhage follows a tear of the sac.

The principal dangers in the operative treatment of aneurisms were formerly, and are to a less extent to-day, secondary hemorrhage and gangrene.

As regards secondary hemorrhage, the principal reason given for

it is atheroma of the arteries, and Hunter advised tying at some point distant from the sac.

The fallacy of this theory is proven by C. O. Weber, who says, "In traumatic aneurisms the artery is as thick near the sac as further above and in cases of atheroma we may be sure that an artery nearer the heart is as diseased as the artery bearing the aneurism." Weber has also proven by numerous experiments that an atheromatous artery is as easily obliterated by ligature as a healthy one, and comes to the conclusion that in Hunter's method the danger of secondary hemorhage is as great as in Anel's, or even in Antyllus' operation.

Here Weber has gone too far, for in Antyllus' method, incision and ligature above and below protects least against hemorrhage. For here primary union is impossible, the sac often covered with calcareous plates remains behind and induces suppuration; and this easily causes secondary hemorrhage. The suppuration dissolving thrombi in a number of the smaller blood-vessels which were not tied off.

In extirpation this need not be feared as all the vessels are tied off after the shelling out of the sac.

In none of the cases was there secondary hemorrhage, which is not so remarkable considering the number of cases healing by first intention.

The danger from gangrene increases with the proximal ligature of the sac, and therefore the Hunter operation is more dangerous than Anel's, Antyllus' or that of extirpation.

In the latter operation there is rapid formation of collateral circulation.

In a case of Wahl's after extirpation of an arterio-venous aneurism cedema of the leg disappeared and a larger ulcer of the leg healed.

It has often been said that the consequent gangrene was due to injury of the veins. Experience has taught us that this view is false. Injury of a vein in no wise need lead to gangrene, and in most cases where this took place, the veins were intact. In the 39 cases the veins was opened 3 times in femoral aneurism; in popliteal aneurism, 5 times; in axillary aneurism once and in brachial aneurism 3 times. In all these cases gangrene set in but once; in a case of femoral

aneurism, small gangrenous spots appeared on the sole of the foot. Wounding of the vein does not seem dangerous in most instances, for as is shown in some of our cases pressure of the aneurism partially or wholly obliterates it, and collateral circulation is already established. Nevertheless wounding of the veins is to be avoided where possible, although in many cases this is difficult owing to the adhesion of the veins to the sac.

Koehler in popliteal aneurisms applied a ligature to the calf of the leg and bandaged the leg up to the aneurism. Then he applied a second elastic band to the lower part of the thigh and removed the first band; this allowed the veins to be filled up with blood and the dissection was rendered much easier. If this cannot be done, it is advisable to leave a portion of the sac attached to the vein as Trendelenberg has done.

Statistics of Delbert show that in large aneurisms treated by excision and extirpation (68 cases) gangrene occurred in 2.94 per cent., while in ligation of similar arteries (224 cases) it was 7.58 per cent.

In our forty cases there was not one instance of gangrene. As regards mortality; Delbert puts it for ligation at 18.75 per cent., for incision and extirpation together it was 11.32 per cent. In our cases it was only 2 per cent.

Extirpation is therefore with reference to hemorrhage and gangrene less dangerous than ligation.

The patient is saved from various dangers which threaten him after ligation or to a less extent after Antyllus' method.

With all its dangers the method of ligation offers the least guarantee of a permanent cure.

In many cases it has no effect on the aneurism, and in others, after an apparent cure pulsation recommences in the sac.

The method of Antyllus is more favorable; if once cicatrization of the wound takes place, then the cure is positive and lasting.

Most favorable are the results after extirpation. After removal of the sac a clean wound is left behind where nothing interferes with primary union.

We consider extirpation the most rational operative treatment for

aneurisms; this method is less dangerous than the other two and the results are more positive.

The operation is more difficult to perform than the others and this would be of import before the introduction of narcosis, Esmarch's bandage and antisepsis.

Now, greater or lesser technical difficulties do not decide the choice of the operation but rather the advantages it holds out to the patient.

Extirpation deserves to be used primarily in all cases of peripheral aneurisms where the question of operative measures comes up.

S. LANDSMANN.

WOELFLER ON THE SURGIGAL TREATMENT OF GOITRE.1

Part III. The Methods of Treatment of Goitre with Special Reference to the Cases Treated Between the Years 1878 to 1884 at the Clinic of Prof. Billroth (Vienna), and those Treated by the Author Himself at the Clinic in Graz, Between the years 1886 and 1890.

XI. Substitutionary Operations other than Total Extirpation—After the disadvantages of total extirpation had been recognized, especially the extensive paralysis of the vocal cords, (among 38 cases of paralysis of the pharyngeal muscles, 34 concerned total extirpations), tetanus and myxœdema, many authorities advocated again partial or unilateral extirpation. As real substitutes for extirpation may be regarded: 1. Enucleation of the goitrenodes; 2. The ligation of the afferent arteries; 3. The resection of both halves of the goitre.

Extirpation of the Isthmus may take the place of total extirpation in certain cases of goitre. The proposition to extirpate the isthmus has been accepted as justifiable, because there exist numerous cases in which it alone is enlarged, and it was thought that by

¹Summary continued from August. Page 161.

removing the isthmus not only the most important embarrassment to respiration would be gotten rid of, but also the two remaining lateral lobes would be robbed of an important "nutrient bridge"

Indications for Extirpation of the Isthmus. 1. The isthmus must be, considerably enlarged. 2. Attacks of coughing or dyspnœa should occur at the least perssure upon the isthmus. 3. Anterior compression of the trachea must be detected on laryngoscopic examination.

A complete, substitute for total or unilateral extirpation is

The Different Methods of Resection of the Goitre; suggested and performed recently by Mikulicz. Enough of the thyroid gland should be left to correspond to about one-fourth of that structure. Mikulicz preserved that part, which corresponds to the hilus; the point of insertion of the arter, thyroid infer. Billroth saves that portion corresponding to the superior pole of the gland. Under certain circumstances it may be advisable to preserve the portion which forms the inferior pole, or the isthmus. An exhaustive description and criticism of the methods and procedure of the different operators follows, including the names of Mikulicz, Hahn, Kocher, Billroth, etc., etc. Porta seems to have been the first who performed a real resection.

XII. Recurrence of Goitre. The following conclusions are offered:

- r. If, in incomplete total extirpation, hypertrophy of the remaining goitrous gland-substance takes place, then this is to be regarded as a physiological necessity and should not be identified with recurrence appearing in connection with abundance of goitrous tissue.
- 2. In growing people a recurrence is more likely to take place than in older persons.
- 3. The pathological variety of the goitre will be of considerable importance. The rapidly growing forms, e. g., feetal adenoma, will more easily recur than the adenoma gelatinosum; moreover, the feetal adenomata will on account of their multiplicity more easily lead

to recurrence, as after extirpation of some adenoma-nodes other smaller ones, in the parenchyma, may be overlooked.

- 4. The method of operation, according to Woelfler's view, may also have something to do with recurrence or atrophy.
 - C. THE SURGICAL TREATMENT OF CYSTIC GOITRE.
- I. Anatomical Remarks.—The following kinds of cysts may develop in goitrous thyroid glands: (1) serous cysts, (2) colloid cysts, (3) hemorrhagic cysts, (4) compound cystomata, and (5) ecchinococcus cysts, (very rare). A minute topographical and pathologico-histological description of these varieties is given by the author.
- II. Palliative Operations—the Artificial Evacuation of the Cyst.—Simple evacuation of the fluid can never constitute a radical method. In preantiseptic tissues it was quite a successful procedure, on account of the subsequent and often quite extensive suppuration, which led to final shrinkage of the organ; but then this method was fraught with dangers; and to-day through antisepsis where it is free from such dangers, it is, also, bare of success. However, in certain inoperable cases with dangerous symptoms of suffocation (cystic goitre) it may have a place as an important palliative measure.

The following other palliative means receive short consideration. Lifting of the cyst out of the retro-sternal space, recommended by Bonnet; subcutaneous discision of the cyst-walls recommended by Porta and electrolysis!spoken of by Amussat (son).

III. The Radical Methods of Operation.—The author divides these into: (1) Those by means of which the fluid contents of the cyst is evacuated and subsequently an inflammation is set up without suppuration followed by atrophy of the cyst, the whole process brought about by the injection of an irritating fluid: (2) Those by which not only the fluid but, also, the solid contents of the cyst are evacuated, in order to cause inflammation and open suppuration and in this way bring about a cure; drainage and broad incision of the cyst belong under this category, which latter procedure is supplemented by partial extirpation: (3) Enucleation of the cysts: (4) Resection of the goitre or unilateral extirpation of the goitre including the cyst imbedded in the parenchyma.

All these procedures, their special technique, advantages, disadvantages, statistics, etc., are admirably and thoroughly treated of, by the author.

A description of the chromo-lithographic plates and a list of the works of over 1200 authors to which the writer in the preparation of this special work has referred to, are added to the work, making it a most exhaustive modern treatise on *Goitre and its Treatment*.

ALBERT PICK.

INDEX OF SURGICAL PROGRESS.

GENERAL SURGERY.

I. Anæsthesia. By W. M. L. COPLIN, M. D. The writer has administered either ether or chloroform about 3000 times without a single fatal result, either during the administration or within such a reasonable time after its administration as to lead to the inference that the anæsthetic was the immediate cause of death. He has anæsthetized an infant but a few hours old and a woman of 92. No difficulty has ever been experienced with primary anæsthesia, and a man was kept continuously under ether for thirteen hours without any evidence of much shock either circulatory or nervous. Ether has been given the morning following a severe pulmonary hemorrhage and in cases of Bright's Disease; suppression of urine has never been observed. Anæsthetics have been administered in nearly all stages of heart disease, including valvular lesions, both old and comparatively recent; also in the various forms of stenosis, in angina pectoris, and in the functional disturbances characterized by perversion of rhythm. No anæsthetic should be used in fatty heart. When the circulation is sluggish, the anæsthetic is rapidly effective and is not infrequently followed by prolonged post-anæsthesia shock, and when the circulation is extremely active it is followed by the most marked stage of post-anæsthesia excitement. Drunkards are difficult to anæsthetize; in some cases absolute relaxation of the rigid muscles can only be obtained in these patients by placing them in imminent danger. In these instances, if the anæsthesia is begun by chloroform and terminated by ether, the best results are obtained. In these cases and in chronic bronchial catarrh, the hypodermic administration of gr. 1/2 of sulphate of morphine and gr. 1-100 of sulphate of atropine immediately before beginning the anæsthetic facilitates the process and decreases the after symptoms.

More profound anæsthesia is required in genito-urinary, anal or rectal work. The tongue and mucous membrane of the mouth, especially in the colored race, indicate early signs of incomplete oxidation of the blood. This can also be observed by the operator in the venous character of the hemorrhage.

Only an experienced assistant should administer the anæsthetic, and only the perfectly pure article should be employed. The anæsthetizer should furnish himself with one or two towels, a hypodermic syringe charged with one-twenty-fourth of a grain of strychnine, and should have more strychnine in convenient form at hand. He should also have a solution of atropine, each syringeful representing onesixtieth of a grain, and if he so desires, aromatic spririts of ammonia, whiskey, tincture of digitalis, or preferably, digitalin. A mouth gag and tongue forceps are also useful. A battery may also be of use, but artificial respiration is probably more certain. The Allis inhaler is advocated. The patient should have no food for at least twelve hours, except clear boullion or beef tea. Milk should be prohibited. In weak and debilitated individuals an enema of peptonized milk and egg, and perhaps some stimulant, may be administered at least two hours previous to the operation. In these cases the morphine and atropine should be employed. The mouth should be personally inspected and the respirations and heart-beats counted. The heart should be examined, preferably some time before the excitement of the proposed operation. All head jewelry should be removed. All tight clothing should be removed or loosened. If there are bandages necessary about the head and neck, a pair of scissors should be at hand to cut them away at the first intimation of impeded respiration. In women the head should be covered by an antiseptic towel or a bathing cap. The prominent arteries about the face should be located. The administration of the anæsthetic is preferably begun by allowing the patient to breathe for a moment or two through the uncharged inhaler, then drop by drop the anæsthetic should be added, gradually increasing the amount until the anæsthesia is induced. The most successful way to overcome the period of excitement if it be prolonged and severe, is by the administration of a few drops of chloroform. The absence of the conjunctival reflexes is the best sign

of complete anæsthesia, and it cannot be carried further without danger. Vomiting afterwards is dependent upon three things: the character and quality of the anæsthetic, the condition of the nervous system, and the method of administration. Vomiting cannot always be prevented, although skillful administration and preparation of the patient will reduce the frequency with which it occurrs. The morphine and atropine injection by diminishing the amount of mucus secreted also aids in preventing the vomiting. The dangers are failure in respiration and circulation. The first may be due to the obstruction or occlusion of the trachea. The former is due to the falling back of the tongue, the latter to a foreign body. The application of external warmth is not sufficiently credited in the treatment of either circulatory or respiratory shock. When the abdomen is opened, flushing with hot water will almost immediately stimulate both cardiac and respiratory sluggishness. The man who gives an anæsthetic should do that and absolutely nothing else.— Therapeutic Gazette.

II. Treatment of Chloroform Syncope. By Professor ALEXANDER A. BOBROFF (Moscow, Russia). The eminent Russian Surgeon gives a careful critical review of all yet suggested methods for treatment of chloroform collapse or syncope, and comes to the following conclusions: 1. The important chapter under consideration urgently requires a most thorough revision, its present condition being truly utterly chaotic. 2. Very many of the methods practiced at present are irrational, i. e., unreliable, useless, or even much worse than useless. The category includes: (a) irritant measures, such as sprinkling or irrigation of the face and chest with cold water; flagellation of various parts of the body with a cold wet towel; slapping and rubbing them with a hand; application of hot napkins to the cardiac region, alternately with cold irrigation; titillation of the nostrils with a feather; nasal inhalation of strong ammonia vapors; insertion of ice-bits into the rectum; enemata of hot water and brandy. All the means are resorted to with the object of inducing in a reflex way deep inspirations and a more energetic cardiac action; in other words, they are expected to produce a stimulating impression on the respiratory and cardiac centres. Meanwhile, every one and all of them are exceedingly uncertain in their effects and eo ipso necessarily involve a wanton loss of a most valuable time; in addition, they are dangerous by themselves, for the history of surgery contains undoubted cases in which this or that kind of peripheral irritation was followed in a reflex way by a complete arrest of the heart and breathing, ending in death at the spot; (b) insufflation of the air into the mouth or through a laryngeal catheter; (c) blood-letting (venous or arterial); (d) tracheotomy; (e) subcutaneous injections of ether or alcohol, and inhalation of nitrite of amyl. All the three drugs act identically with chloroform. Hence their use as antidotes, for the latter is theoretically absurd, and practically utterly dangerous. (f) Subcutaneous injections of strychnine, atropine, ammonia and digitalis. All the four drugs are powerful poisons, whose physiological action is yet very far from being wellknown or well-understood. Indeed, who can tell us how they act on an organism poisoned by chloroform? Who feels prepared to point out the dose of any of the said poisons which is required for reviving a patient suffering from chloroform poisoning? Where lies the boundary between the alleged beneficial action of the would-be antidotes and their own toxic action which can intensify that of chloroform? (g) Irritation of the heart by means of acupuncture or galvanopuncture of the organ itself (Hueter, Bardeleben, Steiner, and others), or by a manual compression of the heart, exposed by thoracotomy (Langenbuch). All the three procedures are unscientific and extremely dangerous. 3. A subcutaneous injection of a saline solution affords the best, safest, surest, quickest and most rational method of treatment in cases of chloroform syncope. As Professor P. I. Dïakonoff's experiments on dogs have shown (Meditzinskoië Obozrenië, No. 24, 1887, p. 1093), when resorted to before a complete arrest of the heart and respiration, the injection is invariably followed by a rapid rise of the arterial tension, and a speedy recovery of the animal, which effect is occasionally observed even after a total stoppage of the cardiac and respiratory action. The same results are obtained in chloroform syncope in human beings, as Professor Bobroff's experience has proved, the author having tried the injections in several scores of cases in the course of the last four years. The

modus agendi of the method may be explained fairly simply: in consequence of the rise of the arterial tension, the blood-supply of nervecentres increases, their vital action revives, the improvement in the respiration and circulation promotes a quick elimination of chloroform from the patient's blood, etc., etc. 4. Hence, when about to undertake an operation under chloroform, the surgeon must keep ready (a) a sufficient quantity of a warm 0.6 or 0.7 per cent. solution of chloride of sodium, or Schwartz's solution (i. e., 6.0 of chloride of sodium, 0.05 of caustic soda, and 1000.0 distilled water); and (a) a large glass syringe, to which is attached a guttapercha tube, measuring 20 or 30 centimeters in length, and armed with a slightly curved hollow silver needle. As soon as a failure of the pulse has been noticed, the surgeon's assistant must at once inject from 25 to 225 grammes of the solution into subcutaneous cellular tissue of the thigh, or arm, or chest. From 20 to 25 cubic centimeters should be injected at a puncture, and a rapid absorption of the fluid promoted by rubbing the spot. In such cases where the patient is not anæmic and has not lost much blood during the operation, it is sufficient to inject from 25 to 50 grammes of the solution; in very anæmic persons, however, or in such cases where the operation has been accompanied by a more or less profuse hemorrhage, the required amount may vary from 100 to 225 grammes. 5. As rational adjuvants, the following measures can be safely recommended: (a) Autotransfusion of blood-i, e., raising one or both of the lower limbs and applying an elastic bandage on them for 3, 4 or 5 minutes. (b) Lowering the patient's head and raising the pelvis—similarly for from 3 to 5 minutes. (c) Faridization of the phrenic nerve; the electrodes should be applied and removed methodically from 15 to 20 times per 1 minute. (d) Artificial respiration after Sylvester's method. The manipulation should be made energetically and aided by pressure on the abdomen during expirations (as suggested by Kraske.)-Khirürgitcheskaia Letopis, December, 1891, pp. 288-299.

VALERIUS IDELSON (Berne).

III. A Neglected Method of Modifying General Anæsthesia. By C McBurney, M. D. The question had frequently oc-

curred to him whether we did not anæsthetize too extensively in operative procedures. While it was desirable to anæsthetize only the nerve centers, by the methods which were in common use, the brain, the nerve centers, the blood, and all the tissues were saturated with the anæsthetic, and all the agencies of elimination were taxed to the utmost in trying to dispose of it. It therefore seemed to him desirable to exclude as large a portion of the circulating fluid as possible from the action of the anæsthetic, and this was done by confining blood in the limbs by bands securely fastened around them. This method was not a new one, but had been used in previous years by Corning, Sweatman and Aiken, of Toronto, and A. C. Post. Corning had advised compression of the limbs with sufficient firmness to exclude all communication of the circulating fluid in them from the trunk and head. The author had practiced this method in ten cases, including a variety of operations. An ordinary ether cone had been used, with from an ounce to three ounces of ether. There was usually no struggling; quiet anæsthesia resulted in from two to five minutes, and there was no congestion of the face. There was very little vomiting or discharge of mucus or saliva. When the operation was completed the limbs were raised, the bandages were removed, and consciousness quickly returned. There might be dangers in the method, but they were not as yet apparent. It was thought that the method might obviate shock to a certain extent, also disturbance of the kidneys and bronchitis. The method was then practically demonstrated upon a man, about twenty years of age, in apparently good physical condition. There was very little Three ounces of ether were used and complete anæsthesia was induced in from eight to nine minutes. The bandages were then removed and consciousness returned in two minutes. The subject answered questions intelligently, and was able to get off the table and put on his clothes .- New York Med. Journ., June 25, 1892.

IV. Migration of a Bullet. By Professor Iona D. Sarytcheff (Moscow), Russia. A generally healthy policeman, aged thirty-six, was admitted in September, 1890, on account of intense pain along the left lower limb and about the anus, painful defæcation, and lameness; the symptoms being of a fortnight's duration. The patient stated that in

1877, during the Russo-Turkish war, he had been struck with a rifle bullet in his loin. The exploration of the wound at the time had given negative results. The orifice had healed in about a year, after which the man had commenced to periodically suffer from attacks of pain about the limb. On examination, Dr. Sarvtcheff found a dense, white, slightly depressed scar in the left lumbar region, in six centimetres from the vertebral column and seven centimetres above the iliac crest. Suspecting that the bullet might exercise pressure on the lumbar plexus, or lie embedded somewhere in the perirectal cellular tissue, the writer introduced his whole hand into the rectum (under chloroform, of course), but failed to detect any foreign body. Nevertheless, a few hours after the exploration the pain subsided, and a few days later the patient was discharged, quite well. On November 9th, he returned with his old symptoms. This time, however, there was also present a slight, but exceeding tender swelling below the great trochanter, while the flexion-movements in the hip-joint proved to be impaired and painful. Painting the whole limb with a belladonna ointment and application of warming compresses speedily relieved all the symptoms, and in a couple of days the man again left well and sound. In April, 1891, he was re-admitted with a distinct swelling, situated in the middle third of the thigh, two centimetres posteriorly from the trochanteric line. The integuments of the area were thinned and livid, and a hard foreign body could be now felt beneath. A longitudinal incision through the skin and subcutaneous cellular tissue exposed a bullet, surrounded with pale and imperfectly-organized granulations. Not a trace of any capsule could be discovered. On the 17th day after the extraction the patient was discharged with a small granulating area in the lower angle of the wound. The bulleta hollow one, of a regular cylindro-conical form—weighed 30 grammes (?? ref.) and measured 2.5 centimetres in length, 5 in circumference, and 1.5 in its largest diameter. Notwithstanding its fourteen years' sojourn in the patient's body, the bullet did not show any alterations, beyond a slight, superficial oxidation.—Khirürgitcheskaia Letopis, December, 1891, p. 359.

VALERIUS IDELSON (Berne).

V. Migration of a Round Worm Through the Deep Muscles of the Neck and its Evacuation Through a Scrofulous Abscess Opening Into the Pharynx. By Prof. Brigidi (Genoa. Italy). The writer describes a specimen contained in the Pathological Museum at Genoa, which is remarkable on account of the unusual migration of a lumbricoid worm. It consists of the first cervical vertebra. The lateral and posterior regions of the preparation are freed from the soft parts and the periosteum while its anterior surface is covered with fibrous tissue and united by a fistulous sinus to what was the posterior portion of the pharynx. This sinus opens on the surface of the mucous membrane of the pharvngeal cavity in an aperture fifteen millimetres in diameter. The first vertebra is completely glued to the underlying one by means of its lateral processes and from destruction of the superior lateral facet, on the left side the second cervical vertebra is slightly dislocated downwards and forwards. The left portion of the posterior arch of the atlas is thinned and in great part anchylosed to the lateral apophysis of the subjacent vertebra. The facet articulating with the occipital condyle is eroded in its vicinity and enlarged in size. The odontoid process is enlarged and anchylosed with the anterior part of the atlas. The atlas was apparently at one time slightly dislocated, so that the spinal canal is constricted, especially on the left. In the depth of the fistulous canal described the extremity of a round worm is to be seen, which, after having passed beneath the left portion of the anterior arch of the atlas, had reached a narrow place limited anteriorly by the posterior face of the mentioned arch, posteriorly by the body of the second vertebra, internally by the odontoid process and externally by the left lateral mass of the atlas. Then the body of the worm describes a curve and is continued in the deeper parts of the lateral and posterior parts of the neck, passing beneath the left portion of the arch of the the atlas in a small spot which had ulcerated out of this bone and of the corresponding portion of the left lateral mass of the second vertebra. The portion of the worm reaching out into the deep muscles of the neck was about five centimetres in length. The anterior extremity of the worm lay in a scrofulous abscess which opened into the pharynx. Many observations have been recorded where round worms have

abandoned the intestines to migrate into distant parts of the organism, either during the life of their host or after death. Indeed, they are frequently found in the mouth, nasal cavity and even in the larynx of cadavers. They have also been found in these cavities in the living subject, those in the nose causing catarrh and those of the larynx death by suffocation. Migration of lumbricoides into the peritoneal cavity is a well-known fact. They have also been found in abscesses of the abdominal walls communicating with the intestines. Cases have also been recorded where they have penetrated into the bladder through an ulcer and been passed out with the urine. Giorgio Pellizzari reports a case where 16 round worms penetrated into the biliary canals and produced an abscess of the liver, a verminous abscess. Cases are known where they have pushed their way into the pancreas or hepatic ducts. Winslow found one in an Eustachian tube. Bruneau described a case where one crawled out of the ear of a young man, twenty years of age. Amatuz, Luzitanuz and Vrayet refer to two cases where a small ascaris issued from the external angle of the eye, and finally, Bizzozero recalled the example of a small round worm crawling into the nasal canal and issuing at one of the puncta lacrymalia. This singular case was observed in a child and is recorded by Perroncito in his work on worms in man and the domestic animals.—Gazetta degli, Ospitali, No. 67, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio).

VI. Thiersch's Skin Grafts in the Operation for Pterygi-

um. By F. C. Hotz (Chicago). To insure the permanent success of operations for pterygium we must arrange matters so that the conjunctiva, after being released from the cornea, cannot be drawn back over the cornea again. In pterygia of moderate extent this is usually accomplished if we close up the gap in front of the retracted pterygium by drawing the conjunctiva from above and below to a horizontal linear wound, but if the pterygium is very broad, the defect in the ocular conjunctiva is so large that the edges of the wound cannot be united without considerable strain upon the sutures, which often tear out, the edges then separate, cicatricial tissue fills the gap and a return of the pterygium is the ultimate result.

In looking for some suitable material which might be substituted for the conjunctiva, Dr. Hotz thought of Thiersch's skin grafts, which, in a number of cases of symblepharon had proven themselves an excellent material for patchwork in the conjunctiva. He had tried this plan in three cases. The pterygium was thoroughly dissected back from the cornea and sclero-corneal region and allowed to retract toward the caruncle as much as it would. Upon the large wound-area, resulting from the retraction of the conjunctiva, a Thiersch graft was placed, shaved off from the forearm and directly transported from the razor to the eyeball. It was found best to cut the graft a little smaller than the wound, especially in the horizontal diameter. The graft was spread out smoothly over the wound with one edge following the margin of the cornea; the graft adhered readily, and after two weeks its whitish color blended well with the white of the eye.

The grafting experiment was successful in all three cases, inasmuch as the grafted piece adhered firmly to the sclera along the corneal border, and formed a strong barrier which effectually stopped the conjunctiva from crossing the corneal border.—Am. Journ. Ophthalmology, July 15, 1892.

SAMUEL LLOYD (New York).

VII. Prognosis of Actinomycosis. By Dr. Schlange (Berlin). The writer has had an experience containing thirty observations of this disease, situated in different parts of the body, and especially in the neck and abdomen and from these he concludes that the outlook is not so grave as is generally thought. In order not to be induced to perform useless and severe operations it is well to know that actinomycosis may cure itself spontaneously by suppuration and the formation of fistulæ. In order to favor this tendency it is well to be content with simple operations, as incision and curretting of the actinomycotic foci. The writer has operated on many cases thus and succeeded in curing several. In another case where there was extensive actinomycosis of the right maxillary, nothing now remains but a small fistula. A woman who had been affected with actinomycosis of the vicinity of the uterus is now completely cured. When first seen an operation was considered impossible, and death was thought unavoidable. Finally, he in-

sists upon the point that even in grave cases of actinomycosis death may only take place after a number of years. Garrè, of Tuebingen, also would not make the outlook as gloomy as is generally stated. Out of 20 cases observed in Tuebingen there were but 2 deaths. eral slight cases have been cured by simple operations. On the contrary, in several patients where an operation was not radically performed, recovery took place after a few years. It is therefore useless to have recourse to severe operations. This relative benignity may be explained in two ways: by the action of other microbes upon the actinomyces, a mixed infection, or by the influence of the air after the incision has been made on the anaërobic microörganism. V. Eiselsberg, of Vienna, called attention to the fact that a case of actinomycosis was published last year which was treated by incision, curetting and subsequently by injection of Koch's lymph. This produced an amelioration, and the patient was discharged, without further treatment. Three weeks ago he was seen and found to be completely cured.—La Semaine Médicale, No. 31, 1891.

FRANK H. PRITCHARD (Norwalk, Ohio).

VIII. Pathology and Treatment of Surgical Gangrene. By M. JEANNEL (Toulouse). In all cases it is the rule that gangrene does not become putrid except secondarily, and then it follows gradually, the symptoms generally dependent upon septic infections,

But the order of the phenomena may be different, sometimes it is putrefaction which appears first or rather it is the septic vibriones or some other septic microbe, which colonizing in the tissues, determines the localized sphacelus or the general gangrene of the member where it is cultivated. Sometimes, on the other hand, it is the general condition of infection that is first seen, and the least traumatism of a tissue or an infected region will provoke gangrene. There is then a septic gangrene and a gangrene by septicæmia or intoxication.

Except the septic vibriones of Pasteur, no specific microbe of gangrene is known, but several, in particular, the different septic and pyogenic microbes, produce gangrene either in the region where they are inoculated or at some distant point by embolism. Several processes are possible:

- 1. Some very virulently septic microbes determine a general sepsis at first, of which gangrene of the inoculated member would be a symptom.
- 2. Some other microbes, having special properties, grow at the point of inoculation with such intensity that they produce a local gangrene before invading the general system.

Some other microbes more or less common, inoculated upon the member of an organism previously intoxicated, produce a gangrene of the region where they are inoculated.

All toxic gangrenes come under one of these types. *Spreading* gangrene or gangrenous septicæmia is the model of the first type under which the gangrenes of the infectious fevers (typhoid, variola, scarlatina, diphtheria, erysipelas, influenza) are classed. Malignant pustule is an example of the second type. The third type would be represented by the gangrene of alcoholism, and of diabetes.

The Contagiousness of Gangrene.—Trophic gangrenes remain localized in the region that sustained the injury, or the arrest of nutrition that produced them. Therefore, for their further increase some external influence, such as a fresh traumatism, is needed. But the inoculation of a microbe plays no role. So long as they retain their virginity these gangrenes are neither contagious nor infectious.

On the contrary, toxic gangrene is putrid from its origin. It is the inoculation of the microbes that engenders it; they are strongly contagious and infectious.

Infection by and in Gangrene.—Trophic gangrenes, amicrobic in origin, are not infectious. Gaudolphe and Courmont have shown that the chemical reactions that go on in the midst of mortifying tissue do not engender septic toxines. The danger commences when the gangrenous space becomes septic; septicæmia is a complication, an accident in the course of a gangrene.

Septic gangrene, on the contrary, is microbic from the beginning. It is always produced by a microbic inoculation which causes a local infection first, then an infection of the entire organism, of which the gangrene is the manifestation or symptom. The excessive virulence of the microbic poison in many cases creates an infectious state from which gangrene results. But the organism may be more or less prepared for inoculation; it may be refractory, but it may be rendered sensitive to inoculation by certain diatheses, e. g., malaria, alcoholism and diabetes.

The preceding pathological classification leads up to these important therapeutic conclusions. We divide them into three classes:

1. Gangrene is trophic; but it may be still aseptic or amicrobic.

The indications here are very clear. Septicæmia must be prevented; that is to say, asepsis must be maintained even should amputation be necessary. Amputation may have to be done in order to overcome the pain from the neuritis. Three methods are possible. First. Expectation and spontaneous elimination of the gangrenous segment. Second. Amputation after the formation of a line of demarcation. Third. Early amputation. Expectation is the necessary method when the pathological state of the vessels and nerves causing the sphacelus is due to constitutional causes, where the limits of the diseased area are well marked, and finally where the constitutional condition is such that a surgical operation could not be borne. Primitive amputation is the best method under all other circumstances. Later amputation is to be done when the reasons that have necessitated expectant treatment have been overcome.

2. The gangrene is trophic but may have been inoculated.

Amputation here is more important, but the same contra-indications are observed as in the former case, except where a general septicæmia is established manifesting itself by a grave general condition and a septic phlegmon threatening the whole member.

The only reasonable treatment then is to clear out all septic spaces with the thermo-cautery, washing them with sublimate solution and powdering them with iodoform and tannin; in other words to embalm the limb and treat the general conditions.

3. The gangrene is toxic. No other means exist except expectation and embalming. Amputation has been advised but the published successes seem to be in cases of trophic putrid gangrene where it

has been undertaken to avoid septicæmia.—Revue de Chirurgie, 10 Mai, 1892.

SAMUEL LLOYD (New York).

- IX. Remarks on Thorough Operations for Cancer of the Female Breast. By W. Roger Williams, F. R. C. S. (England). The unwritten principle underlying the operative treatment of cancer is, that if we completely extirpate the disease the patient will be radically cured. The good results of thorough operations for cancer have nowhere been more decisively manifested than in the female breast (Banks, Gross, Küster, etc.).
- I. In cases of mammary cancer the whole gland is diseased, and must therefore be removed. In many parts of the body, such as the buccal cavity, the outbreak of cancer is commonly preceded by obvious hyperplastic changes (ichthyosis) of the surface epithelia. Moreover, it is noticeable that these lesions are seldom limited to the precise starting-point of the cancerous disease. This clearly implies that the abnormal activity, which at a given spot culminates in cancer, affects in a less degree the adjacent epithelia of the region for a considerable extent. The question arises, whether all parts of the body in which cancer occurs are not similarly circumstanced. Heidenhain has shown that every mamma containing a cancerous tumor is diseased throughout. Its secreting cells are unduly numerous, and they everywhere show signs of excessive reproductive activity, while the periacinous connective tissue is much increased, and infiltrated with small round cells. These results have recently been confirmed by the observations of Messrs. Johnson and Beadles. It is impossible to doubt that parts in such a condition are more prone to originate cancers than perfectly normal structures. Heidenhain is evidently right in maintaining that proliferating acini of this kind, left behind at the primary operation, are the germs whence most late recurrences arise.
- 2. The female breast is normally a very imperfectly integrated organ; like the lachrymal and salivary glands, its constituent lobules, instead of being compacted together in a small space, are generally widely diffused, and often some of them are completely sequestrated.

Hennig has shown that the fully developed female mamma has normally a tricuspid form, two of the cusps projecting towards the axilla—an upper and a lower one—and the other towards the sternum. The upper of these two axillary mammary extensions is very often prolonged round the border of the pectoralis major muscle, right into the axilla; and the same occasionally happens with the lower one. The sternal prolongation sometimes reaches as far as the edge of the sternum, which it occasionally overlaps. In the ordinary operation of amputation of the breast, these processes are almost invariably cut off and left behind. The mamma is embedded in fibro-fatty tissue, which forms a thick layer anteriorly, but posteriorly it is generally defective. Here all that intervenes between the concave base of the gland and the sheath of the subjacent pectoral muscle, generally is some loose areolar tissue. In this outlying glandular processes may nearly always be found, which, according to Heidenhain, not only adhere to the subjacent muscular fascia, but often penetrate it, and even become embedded in the muscle itself. Here also numerous lymphatics are found. In cases of mammary cancer, these structures, as Heidenhain has shown, are nearly always diseased; and at ordinary operations they are almost invariably left behind. Heidenhain found, on careful examination after removal, that the disease had not been completely extirpated from this situation in 12 out of 18 breasts consecutively amputated for cancer; and he predicted recurrences, which soon followed. To obviate this he recommends that the fascia over the pectoral muscle, together with a layer of the subjacent muscular substance, should be removed in every case.

3. In the vicinity of the mammary gland, completely isolated supernumerary mammary structures are of very frequent occurrence.

Structures of this kind, left behind after operation, sometimes originate late recurrences.

Of 29 such cases, 19 of which came under my own observation, in 15 the tumors were axillary, in 8 they were sternal, and in 6 they were situated above the breast.

In this connection it may be mentioned that cancerous tumors are more prone to develop in some parts of the gland than in others.

Its periphery, for instance, is a much commoner seat of the disease than its central part.

Most of the peripheral tumors are met with at the *upper* and *axillary* parts of the gland. This, in the main, coincides with the results arrived at by Winiwarter and Gross.

4. On careful examination of the periphery of such a growth it will be seen that the passage from the diseased to the healthy tissue is by no means sharply defined; the irregularly growing edge of the cancer is, so to speak, dovetailed into the surrounding pre-existing tissues.

If we examine the growing edge of a mammary cancer we shall find that one way in which the disease progresses is by the continuous centrifugal extension of ingrowing epithelial processes. These spread most rapidly in the directions of least resistance, which are usually along the adjacent lymphatics and perivascular sheaths. These Kuster has found distended with cancer cells. Fine, elongated, cordlike processes of cancerous growth thus arise, which often extend from the tumor far into the surrounding tissues, especially posteriorly. In connection with these, nodular growths often develop, which, to the naked eye, may appear to have no connection with the primary tumor. In addition to these, there are frequently found in the vicinity of the primary tumor really discontinuous nodules, which are the first signs of regional dissemination. These arise, as Langhans, Waldeyer, and others have shown, from cellular elements detached from the primary tumor, and conveyed thence by the lymphatics or veins, or by their own spontaneous movements. In addition to the foregoing, small discontinuous satellite nodules are occasionally found in the vicinity of the main tumor, which arise as spontaneous outbreaks of the disease in outlying proliferating acini. To avoid these sources of danger, the incision for the removal of the disease must be carried as far as possible from the primary neoplasm.—Med. Chron., June, 1892. SAMUEL LLOYD (New York).

X. A Contribution to the Statistics of Cancer of the Female Breast. By Dr. G. DIETRICH (Altenach). D. presents an exhaustive and critical analysis of the cases of mammary cancer

observed in Lücke's clinic at Strasburg during the decade ending with 1890. Of these there were 104, exhibiting 100 primary operations—two in which the breast alone was removed, 98 in which the operator invaded the axilla.

The tables are modeled essentially after the plan followed by Winiwarter, Oldecop, Sprengel and others, and present nothing exceptional or striking. The largest number of cases occurred in the five years between 46 and 50; 19 per cent. of the women had borne more than 6 children, in 12 cases there was a history of mastitis, in 10 one of trauma; three cases were preceded by eczema about the nipple. Hereditary predisposition was present in six cases.

The upper and outer quadrants were affected far more frequently than the lower and inner (as is also stated by Winiwarter and Oldecop). All cases were histologically examined by von Recklinghausen, so no doubt remains regarding diagnosis.

8 patients, 7.6 per cent., died shortly after operation, 3 from erysipelas, 1 from croupous pneumonia, 1 from pulmonary embolus, the remainder from metastases. As regards the chief point, ultimate result, we find 13 patients, 16.2 per cent., free from recurrence upwards of three years after operation. This includes two cases which succumbed to inter-current disease—free from recidivity,—5 years after removal of the tumor. Late recurrence in the third and fourth years, was noted in three cases.

[It is to be regretted that the author does not separate the cases extensively involved from those seen and attacked while the disease was in its early stage. It is manifestly unjust, in computing statistics of any form of malignant disease, to allow the percentage of "cures" to be made up from a list embracing advanced cases.]—Deutsch. Zeitsch. für Chir., No. 33, Heft 4 and 5.

CHARLES A. POWERS (New York).

XI. A New Method of Controlling Hemorrhage During Disarticulation of the Hip. By H. W. Boone, M. D. The following plan of securing the elastic tourniquet has been suggested: Get a new pair of suspenders of non-elastic webbing, such as men wear to keep up their trousers. Surround the sound thigh at the groin

with a soft handkerchief, folded to make a band, and which has been made antiseptic. Put the knot on the outer side of the limb, pass two stout tapes, eighteen inches long, under this band in front, and also one behind the thigh. Fasten these loops of tape through the two button-holes in the front straps of the suspenders and the one buttonhole at the back of the suspenders, on the sound side of the body. Lay the patient on his sound side; then put two tapes, about five inches apart, along the trunk and the back of the thigh that is to be amputated; keep them in place by the hands of an assistant, or by adhesive straps across them; lay two tapes, five inches apart, along the front of the thigh and abdomen, and keep them in position. Pure elastic tubing, half an inch in diameter, is then wound five or six times around the thigh, keeping it well up at the very highest point at which it can be applied; then secure by tying it. Take the two posterior loops of tape in the hand and tie one tape securely in each one of the posterior suspender-straps. Take the two anterior loops of tape in the hand; fasten them through the two front buttonholes in the front straps of the suspenders, and then let the assistant tighten up the suspenders by drawing the straps through the buckles, while the surgeon is elevating the elastic tube from the body and drawing it further upward. In this way the surgeon can adjust the elastic tube to suit himself. It is firmly held; cannot slip, and it needs no assistant to look after it. He can slack up the tube and cut the tapes whenever he wishes to do so. In this way the punctures through the thigh are avoided.

XII. Treatment of Syphilitic Strictures of Rectum by Means of Kraske's Sacral Extirpation. By Dr. E. Herczel. The successful treatment of these strictures constitutes one of the most intricate problems of surgery, not only on account of the considerable loss of substance, but also because the interstitial cellular tissue becomes inflamed to such an extent that a rigid infiltration of the walls of the rectum and the adjacent tissues takes place.

This rigid infiltration usually causes the anal portion of the rectum to present itself as a stiff, long and unyielding tube. The occurrence of a shrinking process in the cellular tissue maintains a continued tendency to cicatricial contraction, and the ordinary therapy, bougie-treatment, becomes illusory in many cases, owing to the irritability of the mucous membrane.

Cure is often partly attained in cases of short cicatricially contracted strictures which are not too high up in the rectum (most strictures are, fortunately, only a few centremetres above the anal aperture) by means of treating with Paquelin or Galvano cautery or, in bad cases, by sphincterotomy. But a complete cure is but rarely possible.

Cure is still more problematical with ring-shaped, strongly cicatricial contractions. Here we may excise the ring (according to Diefenbach) and sew up the mucous membrane.

Those cases are most difficult in which the constricted portion of the gut is long and narrow and reaches high up, since the fistular ducts entwine and lace the rectal tube which resembles a thin, hollow cord imbedded in a strongly resistant callous cicatrix. Fæces are kept back; digestion is disturbed; the pains in the stomach become terrible. Suppurations often appear around the rectum, followed by pelvic peritonitis; the patients emaciate greatly and look cachetic. Even the repeated clearings of the posterior rectal wall are only temporarily successful; stenosis will re-appear, sooner or later, and the more rapidly, the higher the stricture reaches.

English operators especially have, in such extremely critical cases, procured a lasting canal for fecal circulation by an artificial anus in the region of the sigmoid flexure.

But such an anus is a very defective substitute and, after all, only a palliative measure. The possibility of a normal fecal discharge at its natural place has, I am convinced, been found in Kraske's sacral intestinal extirpation, by which even very high strictures can be radically resected and cured.

The results of this operation having been excellent in two cases reported by Richelot and Fermir, H. undertook it with a woman afficted with a luetic stenosis about eight cm. long and nearly complete. The intestinal resection was very complicated and difficult, but highly successful, the patient being free from pain, visibly improving and having one normal and easy discharge.

The incision was fourteen cm. long from the right rim of the sacrum outward down to the rectum. The coccyx was resected and the sacrum above the fourth sacral foramen was transversely chiselled off. The entire periproctal cellular tissue was largely infiltrated. The thinned rectal tube was imbedded in a compact mass. The parenchymatous bleeding from this cicatricial mass was strong, and could be overcome only by suturing the vessels and compression.

After two hours' hard work, the rectal tube was prepared to the extent of about 14 cm., and opened at the height of about 12 cm. The peritoneal cavity was fortunately still closed. The intestinal tube was now split longitudinally and revealed the fact that the upper end of the fissure lay about 2 cm. above the contracted part in healthy mucous membrane, and that therefore, the stricture itself was about 7½ cm. long. The patient suddenly collapsed. The operation could, therefore, not be terminated typically, it being impossible, in consequence of cicatricial infiltration, to draw the central rectal piece up to the external sacral skin. The distal half of the rectal stump was, therefore, amputated, and the free border of the central, movable pedicle (the posterior half of which was cleft) was fastened to the sacral skin with 4 silk-worm sutures. Six other such sutures united the raphe and the former anal mouth. Iodoform gauze tamponade of the periproctal cavities.

The progress was perfectly satisfactory, without reaction or fever.

— Weiner Med. Woch., No. 27, 1892.

SAMUEL LLOYD (New York).

XIII. Researches Regarding the Healing of Severed Tendons, especially the Tendo Achilles. By Otto Busse (Greifswald). After a review of the work and conclusions of Gueterbock, Sourier, Velpeau, Brogoff, Dembowski, Körner and others, B. details at lèngth experimental investigation carried on by himself at the Greifswald clinic, as a result of which he arrives at the following conclusions:

- Blood extravasation only prolongs the duration of healing and in no way contributes to the process
- It is impossible for immediate union of the cut surfaces to take place. Thereis always an intermediate space.

- 3. Lengthening, after division of tendon, can be lessened or quite done away with by suture.
- 4. The newly formed tissue is not, three months after the division, completely that of the tendon. It consists of parallel fibres arranged in bundles, between which the cells lie. These primary bundles are joined by loose connective tissue into secondary, stationary masses.
- 5. The cells of the surrounding connective tissue and of the vessels form the major part of the new tissue.
- 6. The tendon corpuscles begin to proliferate only when the cut ends of the tendon become invested with new vessels.—Deutsch. Zeitsch. f. Chir., Bd. 33, Heft. 1.

CHARLES A. POWERS (New York).

NERVOUS SYSTEM.

I. A New Osteo-plastic Procedure in Spina Bifida. By Prof. A. A. Bobroff (Moscow). The author details an operation which he successfully carried out for the radical cure of a sacral meningo-myelocele in a boy of eight years, in which, after replacement of of cauda equina and nerves within the spinal canal, he excised the sac of the tumor and transplanted a segment of bone from the ilium to fill the gap in the sacrum. B. thinks this procedure applicable to cases of spina bifida sacralis and lumbo-sacralis, and proposes that in defects in the upper lumbar or dorsal vertebræ, a piece of bone be taken from a rib.

He emphasizes, with right, the value of excision in spina bifida.

—Original Article in Centbl. für Chir., 1892, s. 495.

CHARLES A. POWERS (New York).

HEAD AND NECK.

I. A Case of Osteoma of the Frontal Sinus. By Dr. P. NAKEL (Liebenthal). A healthy girl of eighteen years had noticed, during three years, a steadily increasing tumor of the right frontal region. It was accompanied with occasional pains of greater or lesser severity, and when seen had reached the size of an apple. Incision over the frontal sinus revealed a rounded, smooth, bony tumor pressing forward

the anterior wall of the sinus and attached by a bony pedicle, 5 cm. by 1 cm., to the junction of the frontal and ethmoid bones. Secondary suture, immediate healing, erysipelas in scar, followed by prolonged suppuration in the sinus and final cure. The tumor measured 7 cm. by 2 cm. and weighed 33 grm.

He is able to find record of but nine similar cases.—Deutsch. Zeit. f. Chir., Bd. 32, Heft. 2 and 3.

CHARLES A. POWERS (New York).

II. Congenital Tumors of the Neck—Symmetrical. By Dr. A. Tietze (Breslau). T. reports a case of this rare condition, observed in Fischer's clinic at Breslau. The patient was a girl of two years, whose parents had noticed, since birth, a small swelling on each side of the neck. These were situated just above the middle of the anterior border of the sterno-mastoid muscle and projected 1 cm. on one side, 3/4 cm. on the opposite side. Each was conical; on extirpation the right tumor was found to contain a bit of bone, the left a small piece of cartilage. While unilateral, cervical, congenital tumors are not infrequently met, those which are double are rarely encountered.—

Deutsche Zeitsch. für Chir. Bd. 32.

CHARLES A. POWERS (New York.

III. Result of Linear Craniotomy. By WILLIAM H. MORRISON (Pa.). A patient operated upon by Dr. Morrison and reported in the New York *Medical Record*, July 18, 1891, shows at the end of a year after the operation a decided improvement. Within this time he grew five and three-quarters inches in height. The head measurements had increased half an inch in the occipito-frontal circumference, one inch in the semi-circumference, from one external auditory meatus to the other, one-quarter of an inch in the biparietal diameter and no gain in the bifrontal diameter.

The incision through the bone which was made three-eighths of an inch in width is now not more than one-eighth of an inch in width. In studying the measurements of the head, it will be noted that while all the dimensions have been increased, the greatest gain has been in the semi-circumference from one auditory meatus to the other, amounting to one inch. As the biauricular line represents two-thirds of the circumference of the skull at this point, an increase of one inch in the length of this line would correspond to an increase of about one-half inch in the diameter, but as the biparietal diameter shows an increase of only one-fourth of an inch, it appears clear that the skull has expanded more vertically than laterally.

While the nutrition of the muscles of the lower extremities has improved, there is still decided want of development. He climbs up by chairs, and stands indefinitely. He will follow the chair as it is moved, and will walk if supported by the hand, but his gait is very unsteady. He can stand alone and has done so for half a minute at a time, but is in great fear of falling. He has been found half way up a steep stairway. He listens attentively when spoken to, and seems to understand what is said to him. He protrudes his tongue or offers his hand when asked. When lying down, if told to get up, he does so. He knows what he wants and asks for it. He has acquired many words and puts them together intelligently in short phrases and sentences. He plays with other children and seems to enjoy himself. The annoying, unmeaning crying spells, which were of daily occurrence prior to the operation, have not since occurred.—*Phila. Times and Reg.*., July 6, 1892.

SAMUEL LLOYD (New York).

CHEST AND ABDOMEN.

I. Extirpation of a "Neck Rib" for Pressure on the Brachial Plexus. By Dr. Georg Fischer (Hannover). Holmes Coote reports a case in which an exostosis on a "hals rippe" pressed upon the brachial plexus; it demanded excision of the bone, but aside from this there seems to be no case parallel with that reported by Fischer.

His patient was a woman of 21 years, who had suffered, during seven weeks, severe pain in the neck and left arm, together with cramps in the fingers. Examination revealed a hard tumor in the supra clavicular region, which upon incision proved to be a short rib springing from the eighth cervical vertebra, compressing the nerves in their passage over the first rib. Excision. Cure.—Deutsch. Zeitsch. für Chir., Bd. 33, Hft. 1

CHARLES A. POWERS (New York).

II. Operation for Intestinal Obstruction Immediately Following Abdominal Section. By JOHN W. TAYLOR, F. R. C. S. The site and extent of the obstruction are the most important things to determine. If much bowel is involved in recent inflammatory disturbance and adhesions, enterotomy should be performed. If the extent of obstruction is small, limited to the site of the operation, probably caused by recent adhesions to pedicles or other known sources of irritation, the abdomen should be promptly re-opened and the adhesions broken up. In this case the operation should be performed early, should be certain in its direction or aim, and deliberate in its execution. He reports three cases operated upon within three months. The first was a case of peritonitis, and enterotomy was performed six days after the removal of a tumor of the right ovary. The patient died exhausted on the twelfth day. The second was one of tubal pregnancy when, thirty-six hours after the removal of the tube, secondary operation was successfully carried out. The third operation was done for inflammatory effusion and adhesions close to the abdominal incision, and was also successful.-Am. Journ. Obstet., July, 1892.

III. Catheterization of the Biliary Passages. By MM. Terrier et Dally (Paris). The authors give a careful resume of the anatomy of the biliary passages, and they have undertaken to catheterize these passages on twenty subjects. They have been successful five times, unsuccessful twelve and in three cases they were doubtful, and they conclude that catheterization of these passages is not always possible, because of the valves in the cystic canal, and consequently they have been unable to formulate rules as has been done for the urethra. The procedure is more often successful in pathological than in normal conditions, because the passages are dilated by the retention of the bile. In some of these cases, however, either because of the variations of the cystic canal, or on account of the persistence of the valves, or because the cystic canal opens upon the lateral wall of the gall-bladder, it may be difficult. Forced catheterization, even with a finger under the liver in the abdomen seems to us difficult and dangerous.

All catheterizations should be done with sterilized instruments.—

Revue de Chirurgie, 10 Feb., 1892.

SAMUEL LLOYD (New York).

IV. Gunshot Wounds of the Gastro-Intestinal Tract. By Dr. Paul Klemm (Rija). It may simply suffice to say that, after a careful study of cases of penetrating abdominal wounds received into the hospital at Rija as well as after experiments on animals and a review of the literature of the subject, K. ranges himself with those who believe every such injury to demand exploratory laparotomy. This we believe to be the view held, with few exceptions, by American surgeons.—Deutsche Zeit. f. Chir. Bd. 33. Heft. 2 and 3.

CHARLES A. POWERS (New York).

V. Intra-peritoneal Rupture of the Urinary Bladder. By Dr. H. Schlange (Berlin). S. adds yet another case of intra-peritoneal rupture cured by immediate laparotomy. His patient was a man of 34 years who, while the bladder was well distended with urine, was run over by a heavy wagon. Plain evidences of rupture. Laparotomy at end of 24 hours.

Of interest is it to note that the urine was removed from the abdominal cavity by carefully mopping it up with sterilized gauze napkins. No irrigation. The intra-peritoneal rupture closed by catgut suture. An extra-peritoneal tear was plugged by iodoform gauze. Complete cure, the patient being discharged at the end of five months with a functionally capable bladder.—Archiv. für klin. Chir., Bd. 43, Heft. 1.

CHARLES A. POWERS (New York).

VI. A Practical Substitute for Decalcified Bone Plates in Intestinal Anastomosis. By Dr. R. von Baracz (Lemberg). Von B. proposes the use of plates made from raw Swedish turnips, on the ground that they are easily obtained and quickly prepared. He has used them satisfactorily on dogs and on one living man. They seem to offer no advantage over the potato plates suggested by Dawbarn, and we believe that American surgeons generally prefer, at present, simple unaided suture to the use of plates of any kind.—
Original Article in Centbl für. Chir., 1892, p. 481.

CHARLES A. POWERS (New York).

VII. Gastrorrhaphy for Diminishing the Size of a Dilated Stomach. By Robt. F. Weir, M. D., (New York). In acase suffering from a recurrence of the symptoms of pyloric stenosis a year after gastro-enterotomy, Weir opened the abdominal cavity and found, by passing the finger by inversion of the intestinal walls into the stomach, that the openinginto the latter organ was at least 3/4 of an inch in diameter. Opposite the gastric opening the lumen of the jejunum was increased to nearly double the usual size, the enlargement extending a distance of three to four inches on each side of the gastro-enteric opening. Beyond this point the intestine became normal in appearance. The operation then undertaken was the attachment of the greater to the lesser curvature along the portion of the stomach to the left of the gastro-enteric opening. This was done as follows:

In the centre of the space between the upper and lower borders of the stomach a dimpling in of the gastric wall was made first by pressure of a sound to a distance, say, of an inch. A row of eight or ten interrupted silk sutures was now made, passing through the serous and muscular coats for a distance of from six to eight inches, and the sound withdrawn. A second series of sutures, at about an inch from the first, was again made dimpling in an additional portion of the stomach wall and in a similar manner. A third and fourth row of interrupted silk sutures were applied, until, through a distance of some four to five inches the greater curvature was applied to the lesser curvature. When this was completed, a double fold of the stomach, estimated equal to the breadth of the hand and nearly its length, had been made in such a way that this projected into the cavity of the stomach.

Since the operation the patient has been free from the vomiting and distressing feelings, and has gained in strength and weight. Bircher, of Aarau, Switzerland, had operated previously upon three cases after this method; all three have been successful. If the dilatation of the stomach be associated with a recognized simple pyloric stenosis, and this obstruction be overcome by an operation for the relief of the stenosis the surgeon may consider the advisability of either immediately remedying the undue dilatation by gastrorrhaphy or effecting this diminution in the size of the organ more properly

at a later date, when it has been shown that relief was not to be accomplished by the primary surgical procedure. This operation of diminishing the size of the stomach, from the simplicity of its operative technique, may be assumed to be one of comparative freedom from risk, though, of course, further experience is required to pronounce with any positiveness on such a point as this. It would therefore seem to be properly applicable to those cases of dilatation of the stomach which are constantly found running to a hospital, who are only improved temporarily by the use of lavage and whose progress is associated with repeated relapses.—N. Y. Med. Journ., July 9, '92.

Samuel Lloyd.

VIII. Pyloroplasty for Stenosis after the Heineke-Mikulicz Method. Dr. F. Lange, (New York.) has reported the case of a man, twenty-nine years old, whose family history was good. He had been in good health until about six years ago, when he commenced to suffer from dyspeptic trouble. He was treated for a long time, for nervous dyspepsia and gastric catarrh, but never for supposed ulcer of the stomach. Though he often vomited, he never vomited blood, and no blood was observed in his stools except what was readily explained by the presence of moderate piles. Within the last year he had often vomited large masses containing particles of food that had been swallowed from a day to three days previously. The degree of acidity had often been examined and found to be abnormally great, as stated by his attending physician. He had often very severe cramp-like pain in the region of the stomach, radiating toward the back and the space between the shoulders. His bowels were regular.

An examination by inflation proved the stomach to be considerably dilated. An indistinct hardness could be felt in the region of the pylorus, also some pain on deep pressure. The patient was emaciated but did not present a cachectic appearance. Laparotomy was done. The pylorus was covered by the gall-bladder, omentum, and large intestine, which had to be separated with the thermocautery, scissors, and blunt manipulations to get access to the pylorus. The separation of the gall-bladder was especially tedious, and in this attempt the lumen of the stomach, close to the stricture, was burned into. The pylorus was greatly narrowed and felt like a hard ring; a longitudinal

incision an inch long into the stomach and a like incision into the duodenum proved its lumen as narrow as a lead-pencil. The longitudinal wound was closed by two rows of suture, an internal catgut and an external silk suture. The application of a loose iodoform-gauze tampon and union of the laparotomy wound finished the operation. The wound through the abdominal wall was a longitudinal incision in the linea alba, with a shorter transverse one to the right, about three or four inches in length. The operation was very tedious, requiring over two hours. The patient made an uninterrupted recovery and was discharged after four weeks. His pain had not returned since the date of the operation, and he was in fair health and gaining.

From a paper by Dr. Senn, who reported two of his cases with favorable result in November, 1891, it appeared that this was the eleventh case on record, and that the operation yielded safe and good results.—New York Medical Journal, June 25, 1892.

BONES.—JOINTS.—ORTHOPÆDIC.

I. Congenital Muscular Wry Neck. By FERDINAND PETERson. Dr. Peterson, after discussing at length the various theories in regard to this condition, and reviewing a number of reported cases, draws the following conclusions from his researches and experiments: 1. In all literature no case of wry neck has been proved to have been caused by the rupture during birth of a normal sterno-cleido-mastoid muscle. 2. Clinical experience with the results of rupture of muscles, and also the negative results of experiments on animals, are opposed to considering this condition a cause of wry neck. 3. The occurrence of intra-uterine shortening of the sterno-cleido-mastoid is known, 4. From clinical experience and experiments on animals it is known that the approximation of the origin and insertion of a growing muscle leads to its shortening. 5. An abnormal condition of the amnion explains easily the intra-uterine origin, the frequency of implication of the right side, as well as the frequent presence of wry neck in breech presentations and difficult labors. 6. Stromeyer's theory of a traumatic origin of wry neck has not up to this time been proven. 7. The practical result is that the physician or midwife is not to be blamed for the occurrence of this deformity.—Zeitschr für Orthop. Chir. Bd. I., Hft. I. T. HALSTED MYERS.

II. Operations upon the Knee-Joint from March 1877 to March 1892. By Charles T. Poore, (New York.) Twenty-eight knee-joints have been excised, five erased and in nine the articular ends of the bones have been operated upon.

In the excision cases, twenty-two were cured, one had some bony union, four died and two had the limbs amputated. The shortening varied from "slight" to four inches. In some of the cases it increased slightly after the patient was discharged from the hospital. The usefulness of the limb has been good. There was some bending in the later but none in the earlier cases. The five cases of erasion resulted in two having to have excision performed and in cure for the other three.

Two conditions render excision necessary:

1. Disease in the articulation. 2. Deformity with or without disease. In cases of disease only enough bone has been removed to obtain a flat bone surface, unless the trouble in the bones is great. All abscess cavities, with caseous masses are thoroughly curetted and disinfected. Sinuses in the bone are followed to their termination and the walls scraped. Sometimes large abscess cavities are drained through a separate opening made in the shaft. Stuffing the cavity with decalcified bone, without drainage, has been successful. Sinuses in the soft parts are dissected out and the edges sutured. Patella is generally removed. Although both nails and wire are used it is certainly better to do without either of them. Plaster of Paris splints are not considered satisfactory. Drainage-tubes are not used, but a small pledget of iodoform gauze is introduced into the lower margin of the wound. Three thin splints are applied over the dressing, one extending from a point as high up as possible to below the foot, the other two laterally, and the leg is slung for twenty-four hours. After the skin wound is closed it is put up in plaster of Paris.

Disease evidently began in the bone in at least eleven cases. In cases of dislocation of the tibia, which was much more frequently the seat of the disease than the femur the disease of the articulation does not seem to run so destructive a course. In this condition the ends of both bones very frequently become altered in shape. The management of the cavity left by the removal of the pus in the end of the

bone is not simple as it would at first seem. Left to itself it will not fill in, but a sinus connecting with the bone cavity will persist and discharge for years, the surrounding bone becoming more and more condensed. Three methods for filling in these cavities have been employed: blood clots; implantation of decalcified bone; Neuber's operation of implantation of a skin flap. The first has not been tried in these cases; in one case the second was successful, but better results have been obtained from the last method.

Cases of tubercular disease of the synovial membrane where the swelling comes on insidiously without much pain or tenderness in pressure, and where the skin is white and infiltrated, are cases for early amputation.

III. A New Working School Chair and Sewing Cushion.

By Dr. Wm. Schulthess. Dr. Schulthess, having lately written on the subject of the spinal curvatures of sitting children, makes a practical application in the present paper of some of the facts observed. The lack of interest displayed in the scientific construction of seats and chairs, as evidenced by the wretched models in use in our public places and conveyances, and the real importance of this matter to the health and comfort of not only the children, but of us all, make such papers as this useful and details necessary.

The total inclination of the seat of the chair Dr. Schulthess has devised is eight degrees. It is composed of three boards, the hindermost corresponds accurately with the total inclination; the middle board is set at the greater angle of fourteen degrees with the horizontal, in order to prevent the pelvis from sliding forward; the anterior has an inclination of only four degrees. The back part of the seat must not be inclined upwards at all, as this would by piling up the clothes interfere with the proper use of the seat.

The back of the chair is set at an angle of one hundred degrees with the total inclination of the seat, and if prolonged downward, should fall 8-10 cm. behind the spot on which the tuber ischii rest. If this distance is too small, the lower border of the back which must not extend below the mid lumbar region, pushes forward this part of the spine and with it the pelvis which prevents the scholar from using with comfort the back part of the seat, or makes a very kyphotic

position necessary. If this distance is too great there arises too great an inclination of the sacrum backward with a tendency of the body to slide forward, causing a strongly bowed position of the spine,—which by the way is very liable to be overlooked, as the upper part of the body seems pretty straight. There is a slight transverse hollowing out of the two boards composing the back of the seat, more marked in the lower one to correspond to the configuration of the body. The author found by experiment that this inclination backward allows the spine to stretch out, and produces pressure conditions in the great body cavities similar to those in standing. Besides, to retain this position requires the least possible expenditure of force, as is demonstrated by the fact that should a person so seated faint, he would remain sitting and would not fall over forward. A foot bench is required with its upper surface inclined towards the chair.

The sewing cushion recommended by Dr. Schulthess is to be used on a flat table and consists of a cement or heavy wooden wedge-shaped block. Its upper surface slopes toward the scholar, while the back, right, and left sides are perpendicular. The lowest part runs out in a level surface about 4 cm. broad, which forms a sort of balcony. Only the highest edge is upholstered for attaching the work. In use the scholar places the left hand on the balcony and fastens the work at the highest point, thus the material descends toward the hand, thereby giving a good view of the field of work. The scholar, therefore, is not inclined to assume faulty positions in order to secure better illumination.

As children of various ages must be instructed, the size of the seats must be graded, and the measurements are as follows, in centimetres:

	CHAIR,				TABLE,		FOOT-REST.		
-	Height of back.	Ground to lowest part of seat,	Ground to high- est part of seat.	Depth of seat.	Height.	Breadth.	Height forward.	Height behind.	Breadth.
Largest size	47	44	49	39	76	44	22	16	23
Middle size	44	42	47	39	73	44	16	10	23
Small size	42	40	45	39	71	44	12	9	23

Zeitschr F. Orthop Chir., Bd. 1 Hft. 1.

IV. Cases of Bending of the Neck of the Femur. By DR. JULIUS SCHULTZ. From the clinic of Dr. Hoffa Dr. Schultz reports the following case. A perfectly healthy girl of 14 years complained of a gradually increasing limp, which had first been noticed when she was 3 years old. She also became tired quickly when walking. There were no other symptoms. Examination showed the trochanter major on the right side to be 7 cm. above the Röser-Nelaton line, but there was no shortening of the bones below the trochanter. There was slight atrophy of the muscles about the hip, adduction was slightly restricted, but all the other motions were free. There was no dislocation. The family history was good, and the patient had never presented any of the symptoms of rickets. A small ulcer had been seen over the right hip when the limp was first noticed, but it quickly healed without treatment and left no scar. There had been no traumatism, and at no time had there been any evidence of inflammation. Dr. Hoffa made a subtrochanteric resection, and a new joint with free motion, and but 3 cm. shortening of the limb was recorded at the end of six months. There was no pathological change in the acetabulum, the joint capsule, the cartilage or the ligamentum teres. The head of the bone seemed, however, only two-thirds of its normal size, the loss being on the side nearest the epiphyseal line. The neck of the femur met the shaft at an angle of 60° instead of the normal 126°. It was bowed with convexity upward, and there was a second bowing with convexity forward. All the neck, but only the upper third of the head, was in the line of direct pressure of the body's weight, and these parts were markedly sclerosed. This appearance was gradually lost at the junction of the neck with the shaft and trochanter. There was no bony callus anywhere nor any other evidence of inflammatory processes.

The case was considered one of rachitis localized in the neck of the femur, and the curvature in the vertical direction to be due solely to pressure from above, while the rotation was ascribed to the action of the powerful external rotators attached to the great trochanter. The adduction was limited by the shortness of the inferior border of the neck and blocked by the lower edge of the acetabulum.

Röser in 1843 and Zeis in 1851 had described this condition, but had not made the correct diagnosis.

Similar cases had been reported by Ernest Muller (Beitrage zur klin. Chir. Tubingen 1889 B. 4), Rotter and Lauerstein (Arch. f. klin. Chir. Berlin, 1890. Bd. 40), the latter having proved by microscopic examination the rachitic origin of his case. Investigating further now the hip conditions and relations in rachitic children and adults, he found that in a great number the trochanter major was 1-2 cm. above the Röser-Nelaton line, and that there was a pathological bending of the neck of the femur, this slightly restricting abduction and rotation. As both limbs were similarly affected, however, these changes rarely gave rise to any symptoms.

This condition is one of adolescence, though it sometimes begins earlier, and is usually unilateral. The vertical curvature is constant, but the rotation may be either backward or forward.

Dr. Schultz advises antirachitic treatment, and in the progressive stage in order to prevent bowing, the use of extension of the limb at night and a protecting splint while walking, a high sole being worn on the sound side. He recommends massage also, to prevent muscular atrophy.

When the condition is stationary, a high shoe may be worn on the affected side if the deformity is slight, or a greater shortening may call for resection as in Dr. Hoffa's case.—Zeitschr f. Orthop. Chir., Bd. I Hft. I.

T. HALSTEAD MYERS (New York).

V. An Unique Derangement of the Knee-Joint Demanding Surgical Interference. By Robert F. Weir, M. D., (New York). Dr. Weir reports two cases of women who had had varying attacks of knee-joint trouble for some months, and who developed a peculiar jumping movement, which could only be felt when, the fingers resting lightly upon the patella, the leg was carried forward in extension, but it could also be seen just outside the middle of the patella when flexion was partially accomplished, or more exactly when the limb was bent one-third toward a right angle. With this condition there was increased inability to flex the limb after it had been brought to a fully extended position, and she could not change from extreme extension to flexion unless the limb was allowed to rest upon the floor. There was also

some difficulty in extension when the knee was flexed. She was able, when the limb was fully extended, the heel supported, and the quadriceps extensor thus fully relaxed, to appreciate, by crowding the patella against the femur or by gently pushing the patella upwards, that a sudden over-riding, from the interposition of some abnormal membrane or tissue, existed. The joint was opened by a lateral incision and the patella was so much raised that its inferior surface could be plainly and entirely seen. From its surface at about the junction of its upper and middle third was observed a bluish-white duplicature, which hung downward when the bone was raised, and which, when the retractors were withdrawn and the joint permitted to resume its natural relations, could be seen through the incision to rest between the patella and the articular surface of the femur, with its thicker free edge downward, and of a length of nearly half an inch, so that it would be, and actually was seen to be, caught by the motions which were then made of pressure upward; in other words, as would occur in active flexion of the joint. This thickened fold of membrane was about one-fourth of an inch in breadth, and extended all across the patellar surface, and hung free half an inch when the patella was lifted up, or when pressed upon by the patella was fully an inch long on its free surface and then was reduced to about one-eighth of an inch in thickness. With the forceps and scissors the entire mass was removed from a rather broad surface on the upper-joint surface of the patella, that is to say, over a space of one-third of an inch in diameter at its widest part. Slight oozing of blood followed, which was controlled by the pressure for a short time of a sponge. The cartilage underneath the outer edge of the patella was somewhat irregularly grooved, but nothing was done to this.

The patient has from that time to this done well, having regained the power of the limb, some slight sensations being, however, met with in going up and down stairs,

In the second case, with a blunt retractor introduced into the joint, so as to elevate the quadriceps tendon above the patella, a beautiful exposure of the bone was obtained, and a transverse band, running across the upper third of the patella, was found, of what appeared to be a hypertrophied epithelium of the cartilage, which presented itself

as an elongated fold hanging downward a distance of nearly threequarters of an inch. On the corresponding surface of the femur was found a smaller but similar fold, about three-quarters of an inch from the edge of the cartilage, which was no more than half an inch across, attached just above the intercondyloid notch. These growths were removed without difficulty by a toothed forceps and scissors.

The mechanical impediment to the satisfactory motion of the joint in these two cases appears to have arisen, in the first place, probably from a traumatism which resulted in an effusion of blood, which either alone or by subsequent inflammatory action determined the formation of what has been happily described by Sayre as a joint blood-blister. This loosened layer of epithelium, under the motions of the joint, was subsequently converted into a fold which produced the mechanical obstruction. In the second case the etiology may be more correctly referred to the rheumatic trouble, of which she gave a tolerably clear history. Though the first case was involved with considerable doubt in its diagnosis from the absence of any experience in this condition of affairs, yet attention was early drawn to the peculiar symptom of the difficulty, after extension, of not being able to flex the limb without first bringing the action of the extensor muscles at an end by resting the heel on the floor, together with the singular jumping sensation which could be imparted to the patella when it was rendered free from muscular tension. These facts in the second case made the diagnosis comparatively easy.—Medical Record, July 16, 1892. SAMUEL LLOYD (New York).

VI. Tuberculosis of Bone. By N. P. Dandridge, M. D. (Cincinnati). The tubercular process, due to bacillary infection, is necessarily very chronic in its course, but may under favorable circumstances be confined to a local affection, and terminate spontaneously, generally however, leaving permanent evidence of its presence by the development of cicatricial tissue, which follows the destructive effects of the bacillus upon the tissues invaded. By far the larger portion of chronic diseases of the joints, and according to Volkmann, all cases in children, commence as a tubercular ostitis, and in only the minority is the synovial membrane first attacked.

Abscesses frequently develop. These may be directly connected with the disease in the bone or in the joint cavity, or may be apparently independent of the primary foci. In a limited number of cases absorption and disappearance of the abscess may take place, but in the great majority of cases they find their way to the surface, and very intractable sinuses and fistulæ ensue. Abscess is said to occur in about 50 per cent. of the cases of tubercular joint disease.

Experience has abundantly shown that if the contents of these abscesses is removed and the surrounding tubercular tissue fully destroyed, the lesion loses its tubercular character, and may definitely and permanently heal by first intention throughout, and so abruptly terminate the disease, if the primary focus is controlled, which, left to itself, could only come to an end after a very chronic course, with the possible intercurrence of such dangerous conditions as septicæmia, secondary tubercular foci and generalization of tuberculosis. The effect of tuberculosis of bone is not by any means limited to the destructive action on the bone ends and joints and the invasion of the surrounding tissue. From the earliest stage there is developed a series of "neuro-muscular phenomena," characterized by muscular contraction, which at first causes fixation of the joint, and later results in permanent shortening and fibroid degeneration of the muscles, which produce the displacements and deformities found in joint disease. These muscular contractions play a most important part in the symptoms and course of joint disease of all kinds, and are responsible for much of the pain and most of the deformities, and are indirectly responsible for many of the abscesses, which are of such frequent occurrence. The increase in joint pressure which they produce exercises a destructive action on the softened bone tissue.

First, then, the indications for treatment in the early stage are largely summed up in simple rest of the affected part—a rest which shall avoid the hurtful influence of pressure, of concussion and of movement.

Unless all the means are at han'd to secure perfect asepsis, aspiration of tubercular abscesses should be tried and repeated if necessary, and if a cure is not effected in a considerable proportion of cases the size of the abscess will be markedly diminished, and so

rendered more favorable for a more radical operation. These favorable changes are generally associated with an improvement of the symptoms dependent upon pressure.

Interstitial injections of the emulsion of iodoform into tubercular bone foci and joints and abscess offer sufficient encouragement for further trial, but the cases thus far reported hardly sustain the high estimate held by some of the results of this method.

With more confidence, and with a larger experience, he recommends free incision of tubercular abscess, whether directly connected with diseased bone or not. The incision should be free enough to lay bare the entire cavity, so that the walls can be thoroughly scraped and all diseased tissue removed with curette, scissors or knife. The cavity is then to be thoroughly flushed out with bichloride solution or hot sterilized water. Bleeding may be checked by packing with iodoform sterilized gauze. The cavity is then filled with the iodoform emulsion and sewed up tight, the emulsion being largely squeezed out, or a drainage-tube may be inserted. When this is done the tube should be removed in a short time. The dressing should be so arranged as to make even and firm pressure over the seat of operation, so as to bring into contact the walls of the wound. Increasing confidence is being felt in treating these cases without drainage entirely; complete and satisfactory healing is much more often obtained, and persistent fistula less often left behind, than when a drainage-tube is used, provided, of course, the operation has been so thorough as to completely destroy all tubercular tissue.

These operations must be conducted with thorough antiseptic precautions, from fear of septic infection, and the destruction of the tubercular tissue should be complete, lest a rapid re-infection of the wound surface or recent cicatrix ensue from diseased tissue left behind, or even a general tuberculosis.

In most of the cases of abscess associated with spinal disease thorough and complete operation is impossible. In such cases free incision, free drainage, and frequent irrigation should be practiced. In such cases the peroxide of hydrogen is the best and most far-reaching antiseptic. Of the methods described most confidence should be placed on free incision, and, as a rule, early operation.—*Cincinnati Lancet and Clinic*, June 18, 1892.

SAMUEL LLOYD (New York).

Diseases of Joints in Hæmophiliacs. By Dr. Franz Konic. Out of eight bleeders with bleeder's-joints, which were treated during the last ten years at the clinic in Göttingen, two died from the results of a mistaken diagnosis, a surgical operation for the relief of their condition having been attempted.

We are justified in dividing the joint disease of the hæmophiliacs into three stages. The first stage is that of the first hemorrhage into the joint. The clinical picture of this stage is that of a true hæmarthrosis. Of course, in certain cases and under certain circumstances, the disease can end also with this stage, that is, the hæmarthrosis may be cured. If this is not the case the presence of the blood causes irritation, and a peculiar form of inflammation develops like a panarthritis, and the pathalogico-anatomical, as well as the clinical manifestations, greatly resemble those of tuberculosis of the joint, especially that variety which is known by the name of hydrops tuberculosus fibrinosus. The stage might well be designated as the inflammatory stage, and it is certainly that stage which former authors have designated as white swelling, or tumor albus.

The third stage includes those retrogressive metamorphoses of the joint; the stage of pathological change of the joint of adhesions, of displacement of the articular surfaces, of contractions, of ankylosis, and of deformities.

In brief, therefore, we can divide the course of the disease as follows:

- The stage of the first hemorrhage—the hæmarthrosis of bleeders.
- The stage of inflammation—the panarthrosis in the bleeder'sjoint.
- 3. The retrogressive stage—the stage which leads to permanent deformities of the bleeder's-joint—the contracted bleeder's-joint.

As a rule, there is no traumatism in the case of bleeders, and there must be other grounds that will enable us to diagnose a discharge into the joint as a hemorrhage. If the disease occurs in the case of a

known bleeder or member of a bleeder family, the diagnosis is comparatively easy, and it is only necessary to know further that the swelling occurred very suddenly. An accurate diagnosis is possible where we meet with rapidly developing enlargements of the joints in pallid, youthful subjects; furthermore, by the simultaneous characteristics of other joints, and also by the ecchymoses and blue spots which appear upon the body of the patient.

The first hemorrhage into a joint is frequently followed by entire cure, and without leaving any trouble behind it; but if the disease has once reached the second stage, it is doubtful if it can ever again become a perfectly mobile joint. To the prognosis must also be added the fact that as the patient is a bleeder, he will very likely get other bleeder's joints.

A fresh hemaratherosis in a bleeder should be so treated that the patient does not use the limb. If a lower limb is affected the patient must not walk, and if an arm is affected he must not use it. But, as a rule, he will disregard this injunction, since the first evidences of the disease are so slight as to be little thought of by the patient.

Moderate compression undoubtedly assists resorption.

In the second stage the matter is a different one, and on account of the inflammatory process and pain to the patient the question of operation comes to the fore, and with it the knowledge that we are dealing with the bleeder. Puncture has been employed by Konig in three cases without incurring any serious bleeding, and followed by irrigation of the joint with carbolic acid solution. Two patients were cured and one improved.

But should all operative procedures cease here? Of the three cases in which, owing to incorrect diagnosis, an incision was made into the joint, two died, and one barely recovered.

The contractures may often be helped by plaster of Paris bandages or suitable mechanical appliance.—Med. and Surg. Reporter, June 25, 1892.

SAMUEL LLOYD (New York).

LAMINECTOMY FOR POTT'S PARAPLIGIA.1

By SAMUEL LLOYD, M. D., OF NEW YORK.

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I N view of the interest excited among surgeons by the possibility of the operative treatment of many spinal lesions it may be interesting as well as instructive to publish the result of my tabulation of cases of removal of the spinal arches in Pott's paraplegia.

Naturally the suggestion of operative interference with these lesions comes as a startling suggestion to those not personally accustomed to the brilliant results following the surgical invasion of the other cavities of the body, but the growing tendency among all classes of observers to recognize the fact that while theoretically abscesses may be produced and continued by non-pyogenic influences, they never exist in this condition clinically, settles more definitely than formerly the question of treatment. Whether the presence of the bacilli is due to the general systemic inoculation or not, the fact remains that when abscesses are examined microbes are generally present.

Undoubtedly it is a fact, as has been demonstrated by Shaffer, that many abscesses in Pott's disease run a benign course, but it has also been demonstrated histologically as well as clinically that an encysted abscess, even though the microbes themselves have succumbed, is a constant menace not only to the integrity of the parts originally invaded but also to the general health of the individual. The recognition of this fact then has led to the surgical axiom that all pus should be evacuated.

¹Read in part before the Orthopædic Section of the New York Academy of Medicine, Feb. 20th., 1891.

In carrying out this principle different operators have gone to different lengths, some suggesting that the abscess should only be incised at the level where pointing occurs, while others insist that it should be followed up and opened at the level nearest to the original focus of disease. From the disastrous results of operative procedures upon abscesses connected with the spine in pre-Listerian days it is not surprising that many whose experience dates back to that time should either decry operation absolutely or advocate as little operative interference as possible. From the very condition of things, however, no psoas or iliac abscess can be successfully treated where the opening is only made at the most dependent point. It invariably takes its origin from a bony nucleus and suppuration will continue as long as the eroded bone remains as a nidus for the suppurating process. Its fistulæ are long and tortuous, and they are dilated here and there into independent abscess cavities, which alone would be sufficient to continue the disease for an indefinite period. It is in this long continued suppuration that the danger exists for here there is a constant opportunity for fresh microbic infection without the exercise of extreme care on the part of the surgeon. This infection was undoubtedly responsible for the unfortunate condition observable formerly wherever these suppurating tracts opened externally either by natural or artificial means. At the present time, however, when surgeons are constantly attacking recognized tubercular and septic abscesses and securing union by primary intention, often without recourse to drainage, and in a period of time measured by two or three days or a week instead of the long period covered by the other methods this growing tendency to treat even spinal lesions by the knife is no longer surprising.

It becomes the rule then with the advocates of this method of treatment to follow up sinus after sinus, incise where it comes nearest to the skin, then follow it up again until the point of origin is reached, and the cause removed or proper drainage, lavage and injection instituted.

Burrell, says,¹ "although the appearance of an abscess in Pott's disease may be considered simply an incident in the course of the disease, yet it is a very serious affair unless it is properly

¹ Medical News, 1891, vol. ix. p. 675.

treated, and in many of our patients in spite of all our care it is the beginning of the end; for where an abscess opens and sepsis occurs, unless great care is taken, a fatal ending is inevitable."

Abscess has been found to be almost the rule in Pott's disease. As we are not apt to have caries of the bone in other parts of the body without abscess, the same is undoubtedly true in the spine. It has been found too that abscess has been present in several cases where it was not suspected during life. It simply goes on as an pre-vertebral lesion and is not recognised until it has dissected away the tissues and burrowed its way up to or through the external coverings. Thus in the present series of cases, although abscess is not referred to in twenty-five of the cases, the nature of the lesion indicates its presence in the majority. In thirty-six it is definitely stated that it was present. In only seven is it certain that it was not a part of the lesion. Of these thirty-six cases in which we have the exact statement to depend upon sixteen were cured, three were unimproved and seventeen died. In these last twenty cases one died of empyema from perforation of the pleura during the removal of a carious rib, seven were not relieved from the suppurative disease, while four were free from all signs of abscess up to the time of their death. In the sixteen noted as cured only two suffered a recurrence of the abscess and then apparently only slight suppuration in the cicatrix.

It is interesting to note that in these cases ten had abscess within the spinal canal pressing more or less upon the cord and constantly threatening an extension of the disease by gravitating downward, leaving a septic meningitis in its track. Eighteen had disease in the bodies of the vertebræ and in many of these perforation had taken place into the spinal canal and pressure was exerted on the cord by the abscess and the caseous material surrounding it. In only five of the cases were the arches involved and in one there was both an extra and a sub-dural abscess.

It was for the relief of these suppurating foci in the lumbar region that Mr. Treves, in 1884, suggested an operation whereby he was able to reach and remove foci of disease on the anterior face of the lumbar vertebræ, and a number

¹Med. Chir. Transactions, vol. lxvii, p. 113.

of other operators have traced abscess cavities from the lumbar region upwards. In one case operated upon by Delorme¹ the suppurating tract led as high as the level of the fourth dorsal, although the bony lesion was on the anterior surface of the body of the eleventh dorsal vertebra. It was reached by resecting a portion of the twelfth rib and the diseased bone was scraped

away, the patient making a satisfactory recovery.

Boeckel,2 in 1882, resected a portion of the third rib for caries and discovering a mass of flabby granulations leading towards the spine passed his finger along the track into the posterior mediastinum where he felt the eroded bodies of two vertebræ, probably the second and third dersal, and a cavity of about the size of a small nut filled with pus and bony detritus. This was cleaned out with a spoon and at the end of five months his patient had made an almost complete recovery. Grünbaum³ has also removed a portion of the body of the tenth dorsal vertebra with a curette. Israel, also in 1882, opened an abscess leading under the twelfth rib which was rough and denuded of periosteum. On resecting this he found that the corresponding articular portion of the twelfth vertebral body was carious and presented a cavity filled with bony detritus, caseous granulations and pus. This cavity was scraped out and an opening made posteriorly exposing the spinal canal and giving vent to pus. This latter opening was then enlarged and a part of the body of the twelfth dorsal vertebra and the intervertebral cartilage between it and the first lumbar were removed. The membranes were forced to the left and flattened. After the operation the fever ceased, but the paraplegia was not improved up to the time of the patient's death, which occurred thirty-seven days later of empyema of the right side caused by a perforation of the pleura in the neighborhood of the carious rib. Abbe has also removed the transverse process and a portion of the body of the twelfth dorsal vertebra with success.

In cases where abscesses are present it is a comparatively safe procedure to explore the bodies of the vertebræ on their

Arch. de Med. et de Phar. Militaires, 1887, Vol. I., p. 51.

²Gaz. Hebd., March 17, 1882, p. 171.

³Centralblatt f. Chir., 1889, No. 7, p. 125.

Berlin klin. Wochens., 1882, No. 10.

anterior surface, and the approach to these foci of disease is rendered easy by the abscess track, which having already established an escape for itself has pushed the intervening structures out of the way. This is not true, however, in the other cases, and the technical difficulties of Treves' operation make an approach to a diseased area when an abscess has not extended far from the point of origin exceedingly serious. Chipault,1 however has applied the method in one case but he emphasizes the difficulties of the undertaking. When an abscess has formed, on the other hand, in addition to the fistula leading towards the diseased centre, there is usually more or less protection afforded by nature to the contiguous structures, either by an exudation of lymph, or by local inflammatory thickening of the pleura or peritoneum, so that the operative measures essential to the removal of the sequestrum or caries is much facilitated and rendered less dangerous, In these cases, therefore, where an abscess has established an opening for itself in the lumbar region or where it is pointing in this region, I can see no reason why the present surgical axiom of evacuating pus whenever it is certainly made out should not be applied, with the further procedure of exploring the abscess for the supposed bony focus and finally removing this suppurating centre, cleansing the abscess walls and attempting to bring the whole region to the condition of a surgical wound. This would enable us to cut short the disease, to remove the septic dangers and to place the patient in a better condition to recover his health and strength.

Chipault ² has given the subject of Treves' operation considerable attention and his paper merits a careful reading.

I have lately found it necessary to apply this technique in the case of a boy in my service at the Randall's Island Hospitals who had a marked kyphosis in the dorso-lumbar region, over which an immense tubercular tumor had developed. He had sinuses everywhere, one at the end of the coccyx, several in the thigh, due to a psoas abscess one in the side at the crest of the

¹Revue de chirurgie, Nov. 1891.

²Arch. gen. de med., Oct., Nov. and Dec., 1890.

ilium, and one on each lateral margin of the tumor. He was rapidly growing worse, and I finally decided to do Treves' operation. The tumor of the back was very vascular, and all hope of being able at that sitting to remove it as well as to get down on, and drain the osseous focus of disease was abandoned, and the latter being considered the more urgent condition for treatment attention was at once directed to the sinuses. Those on the thigh were incised and followed up until a large sized drainage tube could be passed through them. The sinus at the crest of the ilium was found not only to have an external opening but a fistula communicating with the one on the lateral face of the same side of the tumor, and it also dipped down along the inner side of the ilium and communicated with one in the thigh. These were both sufficiently enlarged by careful dissection to allow of thorough irrigation and packing with iodoform gauze. The lateral sinus on the left side was then taken in hand and Treves' incision was made, keeping the fistula as the centre of the incision. It soon led into a prevertebral abscess of the size of a fist containing a large quantity of granular debris and several sequestra ranging in size from a crab-apple down. These were removed and the denuded and carious vertebral bodies were scraped out. The sinus on the other side was then treated in the same way and found to communicate with the same cavity, and it was demonstrated that the coccygeal sinus also took its origin from this source. The improvement has been considerable, and this patient will soon be able to wear a brace, a a thing that was formerly impossible, owing to the presence of so many fistulous openings.

Since the appearance of the brochure on Surgery of the Spinal Cord by W. Thorburn in 1889, in which he reported eleven cases of operation for disease, the number has increased to seventy-five. His table did not include the case of Israel which should be tabulated inasmuch as it was a posterior opening of the spine and an excavation of the posterior surface of the body of a vertebra.

There can be no doubt that Chipault is theoretically correct when he says that the essential consideration in spinal surgery is first "to remove the diseased bony point, that is, to carry out the general surgical idea in regard to tuberculosis of bones," and second, "to relieve the cord from compression, whether by a sequestrum, an extra spinal abscess, or more often by tubercular granulations arising from an external pachymeningitis;" but more practical considerations based upon clinical experience must lead to decided limitations in the application of the method.

The age of the patient is an important consideration. In the seventy-five cases forming the basis of this paper, twenty were adults and thirty-nine children. In the other cases the age was not noted. Thirteen of the adults died. One, Deaver's (No. 23 in our table), from respiratory troubles due to inhibition of the phrenic nerves by exploratory puncture of the cord at their point of origin. Another, Israel's (No. 5), after 37 days of an empyema, due to puncture of the pleura during the resection of the carious rib, before opening the spine; and a third, one of Kraske's¹ (45), lived eight weeks, although the autopsy revealed the fact that the compression had not been removed.

One of Lane's cases (35), having fully recovered from the effects of the operation, died nearly two years later of pulmonary phthisis never having had the slightest return of the spinal symptoms.

In one of Kraske's (48) a recurrence of the disease was noted seven months after the operation, and the autopsy revealed the fact that the spinal symptoms were due to a re-invasion below the site of the former operation which was perfectly healed. Colman's case (44) lived two months and died of exhaustion. There was no improvement in this case, owing to anterior compression which was not overcome and there was also degeneration in the cord. In Demons' case (26), too, the compression was not discovered at the time of the operation.

One of Schede's cases (61) died two and a half months after the operation of tubercular empyema and pneumonia.

In the children, 39 cases 16 deaths, Southam's² (11) was "apparently dying" when the operation was undertaken and was suffering from broncho-pneumonia, while two of Chipault's cases (50 and 51) died three and five weeks after the operation, also

¹ Centralblatt f. Chir.

²Brit. Med. Journ., vol. II., 1888, p. 665.

with broncho-pneumonia. The first case revealed a very extensive lesion including the bodies of the fourth, fifth, sixth, seventh, eighth and ninth dorsal vertebræ. In Schede's cases one died of exhaustion after forty-seven days (59), and another after two months (62). In one the progress of the spinal lesion was not arrested and death resulted in three months (64). while in another the autopsy showed a hopeless degeneration of the cord and a tubercular pleurisy (65). A fifth case died in collapse twenty-four hours after the operation and the autopsy revealed a purulent peritonitis (63). In my own case the operation was undertaken too late (74). I have no doubt had the spinal compression been relieved before the child was completely exhausted that she might have been cured, the decided benefit resulting from an operation that was expected to be fatal even before its termination was a proof of this fact. Phelps' case (67) died of pneumonia one month after the operation, when the spinal symptoms were progressing favorably, while one of Lane's (36) succumbed to a hemorrhage from a rectal polypus, while improvement in the paralytic symptoms was progressing satisfactorily.

It has already been stated by various authorities that Pott's disease in children is decidedly less serious than in adults, and the same condition is evident in cases that have been subjected to operation.

The region also seems to exercise a considerable influence upon the prognosis.

In fifty-eight of the cases the region involved in the disease is stated. Of these fifty-three were dorsal, giving eighteen recoveries, seven improved, eight not improved and nineteen deaths. There are but five cervical cases, two of which were cured while the other three died. One case involved the cervical and upper dorsal regions and one the dorso-lumbar, and both died. In the lumbar region there is one case cured. These figures bear out the fact already noted in a former paper on Laminectomy for Traumatic Lesions of the Spine, that the mortality is higher when the upper regions of the spine are invaded.

The time of the operation after the onset of the disease has varied from a few days to seven years.

¹ Am. Journ. Med. Sciences, July, 1891.

These statistics show simply that there is no period better than another for operation, cures having resulted at five months and at seven years while no improvement has been noted both at six months and at three years. Still this question of when to operate if we operate at all is the most important one we have to answer. It is beyond question that the tendency of paraplegia in Pott's disease, especially in children is towards recovery, even after the lapse of considerable time and when there has been one or more relapses.

Lauenstein's rule in regard to operating after six weeks if there is paralysis of the bladder and rectum and the formation and spreading of bedsores, has been proven by abundant clinical experience to be inapplicable in these cases, however well it may apply to traumatic lesions of the spine. Myers² in a paper read before the Am. Ortho. Asso. has reported that 55 per cent. out of a total of 218 cases of paraplegia were known to have completely recovered, and Gibney out of 58 cases reported 29 recoveries, 50 per cent. Taylor and Lovett have reported 17 recoveries out of 19 cases, and Sayre, 34 out of 38. Myers showed that the average duration of the paraplegia was in the cervical region twelve months, in the upper dorsal nine and one-half, in the lower dorsal six, and in the lumbar region eight months, but cases may recover even after a considerably longer period. These statistics do not show unfortunately whether the length of time the paraplegia has existed, has any effect upon the completeness of the recovery. It would be interesting as it is important to determine how long the spinal cord may remain compressed without the establishment of degenerative changes. In the traumatic cases an entirely different condition obtains, for the interference with the function of the cord has been sudden and severe, and usually accompanied with more or less bruising or concussion. Hence we often find a traumatic myelitis existing after the injury, which serves as an absolute contra-indication to operative interference during its continuance. In Pott's disease on the other hand the compression is gradual, unaccompanied with any sudden jarring of the cord and consequently free from the acute inflammatory

¹ Centralblatt f. Chir., 1886, No. 51, p. 888.
The Prognosis of Pressure Paralysis, Times and Register, Nov. 29, 1890.

disturbances which so often characterize the other class. Still in some cases myelitis occurs and progresses rapidly in Pott's disease, as is well proven by Colman's¹ case (44), but it is impossible to say whether this is due to the compression or whether it may not be a part of the general inflammatory condition surrounding this portion of the cord. Page's case (54), too, in which the secondary degeneration was recognized prior to the operation may be taken as an illustration of this point. Probably both circumstances exercise a certain amount of influence.

It has been stated that degeneration takes place within six months and yet the conservative indications are that a cure may result after a much longer period. It is also always possible that the cord may become accustomed to a certain amount of compression and resume its function until an exacerbation of the disease produces an increased compression compelling a fresh adaptation of the cord to its confined space. This may account for some of the cases that relapse while under treatment by conservative methods.

Theoretical considerations must give way, however, before clinical experience, and consequently it seems impossible to definitely settle upon any time when, as a rule, operation should be undertaken. This must of necessity vary with the individual case and must be modified by the results obtained from properly adjusted conservative treatment. It is safe to say that no surgeon would interfere in any case in which there were other tubercular lesions of any extent complicating the cord lesion. Macewen² has considered marked hectic a contra-indication, but this is a fallacious sign, for the fever may be due to the progress of the vertebral lesion and may be immediately overcome by the operation, as was the case in Israel's patient (5) and in one of Abbe's (21).

Burrell and Bullard have said that "so long as we have reasonable or even moderate chances of recovery without operation we do not believe it advisable or justifiable, in the present condition of spinal surgery, to perform so serious an operation as the resection of the laminæ of the spinal vertebræ." Kraske says,

¹Lancet, Feb. 22, 1890, Vol. I, p. 402.

² Brit. Med. Jour., 1888, Vol. II., p. 308; and 1886, Vol. I., p. 40.

"It is necessary before operating to have exhausted all other methods of treatment. I would only interfere when a paralysis of the bladder is established: this is the one symptom which is so serious as to justify everything."

It is unnecessary to say that no surgeon would undertake an operation of this magnitude where there was any chance of recovery by other means; but there still remains a considerable number of cases that occupy debatable ground, where the chances of recovery without operation are very slight, where continued mechanical treatment yields little or no result, and where at any moment an extension of the lesion may render the patient hopeless if it does not destroy his life. Such cases, in my opinion, had better be operated upon. Then, too, there is another class which show only progression of the disease in spite of all care and where an arrested degeneration is set up again, threatening the integrity of the cord. These should undoubtedly be operated upon and that operation should be undertaken early. How much regeneration we may hope for in a spinal cord we do not know. Some writers taking other nervous structures as a basis claim that it should be considerable and it is undoubtedly true that in cases of incised wounds, when the cord has been apparently injured, judging from the symptoms, regeneration has sometimes taken place and been more or less complete. But the conditions we have to deal with are not similar to incised wounds, the area of degeneration is greater and the progress of the disease is slow; there are no cleanly cut edges to come at once into apposition and allow of immediate reunion. It has also been shown in traumatic lesions that the cord does not recover its functions after a crush and so far no success has followed attempts to unite the severed ends.

Naturally these points do not cover all the conditions present in Pott's disease owing to the different circumstances contributing to produce the lesion, still they serve to illustrate the possibilities of recovery in cases where considerable portions of the cord have undergone degenerative changes.

We are consequently brought to this position. The operation should not be undertaken while there are any good chances of recovery without such interference, but it should not be postponed so long that an ascending or descending myelitis may destroy the patient's chances of recovery, and the first sign of a degeneration of the cord should indicate immediate operation.

This leaves a very hard problem for consideration without any definite means of settlement. Individual cases offer such varying conditions that each one must be debated by itself.

Of the cases in which recovery has taken place, Macewen's first (6) was treated for three years with a plaster jacket, and had at the time of operation motor and sensory paraplegia, incontinence of urine and fæces; limbs wasted and spastic. A thick connective tissue was found over the back of the dura mater. After this was removed pulsation returned and in twenty-four hours improvement was noticed. In his second case (7) practically the same conditions were noted, except that he does not state the duration of the disease, and he says that the cord seemed to be shrunken and the connective tissue mass was so adherent to the dura as to necessitate a removal of a portion of that membrane. He removed the laminæ until pulsation in the cord was noticed, a precaution which should be taken in every case if one is to be sure that the compression is entirely overcome. Horsley's first case (12) had severe caries of the second and third cervical vertebræ with complete paralysis of all four limbs. Eight days after the operation improvement began. The disease in this case only dated back eleven months. His second case (13) had complete paraplegia and pulmonary tuberculosis and had been ill for one year. At the time of the operation a bony abscess was found and improvement set in in ten days. His third case (14) had been ill for five years and was also improved. His fourth (15) of three year's standing was not improved while the fifth (16), a boy of sixteen, who had for eighteen months suffered with paraplegia was improved after the evacuation of an abscess. And his sixth (17), who for eight months was also paraplegic, showed very slow improvement in motion.

Wright's patient (19) had been ill for several months and under treatment six. There was an angular curvature in the mid-dorsal region with first paresis, then spastic paralysis, incontinence of urine and fæces, and anæsthesia as high as the level of the eleventh ribs. There was no abscess. Three prominent dorsal arches were removed revealing a "leathery substance" covering the cord which did not pulsate even after the removal of this tissue. No other constriction was found and no improvement followed either this procedure or the resection of more arches three years later. In Duncan's case (20)

the disease had lasted twenty-one months, and he had an angular curvature in the mid-dorsal region with spastic paralysis, almost absolute, as high as the groin. There was also anæsthesia as high as the abdomen, but no difficulty with either the bladder or rectum. After the removal of the fourth, fifth, sixth and seventh dorsal arches the membranes were found adherent to the bone by granulation tissue which was scraped away: a faint pulsation was then observed. Improvement was noticed on the third day. Abbe's first case (21) of five month's standing, has been considered as not belonging to this class of cases, but a personal communication from him some time ago assures me that it was a case of Pott's disease and not a tumor. This patient had pain and a swelling containing pus over the tenth dorsal vertebra, hectic, partial loss of motor and sensory power in the lower limbs, partial paralysis of the bladder and rectum, and exaggeration of the deep reflexes. The pus was evacuated, and the eighth, ninth and tenth dorsal arches which were carious, were A dense mass of connective tissue and detritus were scraped away from the posterior aspect of the dura. In one week improvement began. In his second case (22) there were symptoms of a considerable tubercular infection in addition to an iliac abscess, through which a probe passed to the twelfth dorsal vertebra. The transverse process of this vertebra was removed and one-half of the body was scraped away without injury to the cord. A cure resulted, although this patient has returned to the hospital once since with a sinus in the cicatrix. He is well again now, however.

In Wyeth's case (29) the disease dated back two years and a half; there was a curvature, including the fourth, fifth and sixth dorsal vertebræ and complete paraplegia and vesical paralysis, urethritis and cystitis caused by catheterization for the relief of which a supra-pubic cystotomy was performed. The dura was found to be tense beneath the right lamina of the fifth vertebra, and an intradural tubercular tumor containing pus was discovered and removed. The patient is reported to be perfectly well September 3rd, 1891. Gerster (30) in a case of long standing with complete paraplegia and difficulty in controlling the rectum and bladder, removed the laminæ of the sixth and seventh dorsal and finding an extensive, extra-and There was also an extensive sub-dural abscess evacuated it. caseation of the soft tissues adjoining the intervertebral focus in which the motor and sensory nerve roots on both sides were embedded. The transverse processes of the fifth, sixth, seventh and eighth thoracic vertebræ on the right, and of the fifth, sixth

and seventh on the left side were carious, and the costo-vertebral articulations were destroyed; these, together with the heads of the corresponding ribs, were removed. The bodies of the sixth and seventh vertebræ, which were much disintegrated, were scraped out. There was no improvement, until after three months when it began and progressed rapidly. Dercum and White's patient (25) had complete paraplegia and anæsthesia below the nipples, girdle pains, exaggerated reflexes, a bed-sore, and pain over the third and fourth dorsal vertebræ which had continued for ten months. The laminæ of the first, second, third, fourth and fifth dorsal vertebræ were removed and adhesions between the dura and the cord were broken up. The pain was relieved at once and he began to improve the next day. In Lane's second case (33) the disease had continued for two years and there was analgesia of both sides, almost complete anæsthesia and exaggeration of reflexes. The laminæ of the ninth, tenth and eleventh dorsal vertebræ and some extra-dural granulation tissue and pus were removed. Improvement began in twenty-four hours. In his first case (32), which was of one year's duration, the compression was due to an angular deformity, and after the removal of the fourth, fifth and sixth dorsal laminæ, it was completely relieved. Page reports that this case relapsed, but a personal communication from Mr. Lane a few weeks ago says that it is still cured. Thompson's case (43) was also one of angular compression of seven year's standing and had complete motor paralysis below the third rib, diminished sensibility and exaggeration of the deep and abolition of the superficial reflexes, but no bladder or rectal symptoms. The seventh cervical and first and second dorsal laminæ were removed. This patient entered the hospital with pneumonia nine months later and died, and an autopsy revealed the fact that there had been a small abscess present.

In Kraske's second case (46) in which there was a cure followed by a relapse and death two months later, due to tuberculosis, the pachymeningitis that had been the cause of the primary trouble was found to have been entirely overcome, but a new focus had been established lower down. Kraske's fourth case (48), with complete motor and sensory paralysis, vesical paresis and a curvature at the level of the eighth and ninth dorsal vertebræ, showed a slight improvement after the resection of these vertebræ, that is, his bladder symptoms disappeared and he could raise his limbs from the bed, but in one month he had a relapse, which was relieved by a plaster jacket, but five months later all improvement had ceased.

In Chipault's first case (49) the disease had lasted fourteen months and there was complete paraplegia with a curvature whose apex was at the seventh dorsal vertebra, the superficial and deep reflexes were exaggerated and there was no vesico-rectal difficulty and no anæsthesia. The laminæ of the fifth, sixth, seventh, and eighth dorsal vertebræ were removed and the next day the patient was able to move the toes of both sides. Finally he lost all he had gained on the right side.

In his fourth case (52) between the fourth and fifth pair of nerves there was a considerable number of fungous granulations and a dozen sequestra of the size of a cherry pit. These came from the body of the fourth dorsal vertebra. This patient had only been ill four months. In his fifth patient (53) there was discovered on raising the cord so as to inspect its anterior surface a fungous growth, which upon removal allowed of the escape of considerable pus and exposed two fistulæ, one leading into the body of the first and the other into the bodies of the second and third dorsal vertebræ.

My own case (74) revealed a cause of compression that was entirely different from any of the others in the table. This patient had a very acute curve due to disease of the bodies of the vertebræ. The removal was begun at the apex of the curve and when the laminæ of the tenth dorsal vertebra had been removed it was discovered that the cord was compressed by a thick, firm band, both above and In order to examine these bands carefully the ninth and eleventh laminæ were also removed when the same condition was discovered. These bands were found on dissection to be the thickened interspinous ligaments which, in consequence of the separation of the posterior part of the spinal column by the curve, had slipped down until they caused firm compression of the cord. The laminæ of the eighth and twelfth vertebræ were then resected and these bands dissected away from the dura to which they were closely adherent. Pulsation then gradually returned and it was also possible to explore the spinal canal above and below with a probe without the slightest difficulty.

Lastly, Page's case (54) had been suffering from the disease for five years and he had incomplete motor paraplegia, limbs wasted and spastic. Sensation was diminished as high as the lumbar back and lower abdomen; there was occasional incontinence of urine and a curvature extending from the fifth to the tenth dorsal vertebræ. He had some symptoms pointing towards secondary degeneration. Upon resection of the laminæ of the seventh and eighth dorsal vertebræ

firm ankylosis between all the bony parts was observed; the dura was not adherent and the probe passed along a bony sinus to the front of the spinal canal and into the bodies of the vertebræ, giving exit to a pus-like caseous material. The body was not scraped out. The day after and for several days his urine had to be drawn and finally it was passed involuntarily; there was also a slight cystitis. Although Page reports that this patient was not improved by the operation he could finally walk.

One argument that has been urged against the application of this method of treatment is that the removal of the arches in cases where the bodies of the vertebræ are diseased, must still further weaken an already weak spine. This is undoubtedly true, but in any case where at the time of the operation it is found that the spinal column seems to be dangerously weak, Hadra's method of wiring the vertebræ could be employed. If there is no immediate danger from the effects of the removal of this portion of the spine the natural tendency will be for the operative gap to fill up either with a dense, fibrous tissue, as has been demonstrated in some of the cases where a secondary operation has become necessary, or there may be a deposit of new bone, as in Chipault's case (53) where a thin shell, proven by histological examination to be osteo-plastic, was found.

If Abbe's technique is employed the section of the arches is made subperiostially and the spines are lett attached to one of the flaps so that the probabilities are in favor of the formation of new bone. Urban has suggested what he calls a temporary resection where one side of the arch is severed completely, while the other side is only cut through sufficiently to allow of its being bent back, exposing the cord. This method has been applied four times, twice for fracture with success and twice unsuccessfully (72 and 73) for Pott's disease.

I believe that extension and counter-extension should be continued for a considerable period after the operation in the hope that if ankylosis has not already taken place in the bodies the kyphosis may be somewhat reduced while the rest for the spine will favor more rapid union of the diseased bones.

Page's case and one of Schede's (59) illustrate a point which was observed in the traumatic cases, that an operative manipulation of the cord may cause an increase of the symptoms for a short time after the operation, thus increasing the probabilities of an in-

crease in the inflammatory conditions if the operation is undertaken after they are established. In both these cases the mallet and the chisel were employed instead of the cutting forceps which seem to me to be preferable. In the traumatic lesions we can wait for this to subside, but in the compression cases of long standing the risk must be assumed.

It is undoubtedly very hard to deduce absolute conclusions from such a small number of cases as those which we have been able to tabulate, yet it is extremely important to determine what is to be expected from the operation. Personally, I cannot say that I can see any very brilliant future for it. It can be applicable to less than fifty per cent. of the cases of Pott's disease, as proven by the statistics of Gibney and Myers, and even in this small number its application is limited again to those cases where the compression has not produced a complete degeneration of the cord. Still, it is not by any means to be relegated to the obsolete class of operations; it has a place and that place, I am convinced, is destined to play a more important part in the therapeutics of Pott's disease than it has done heretofore, as its limitations are more fully understood and its technique simplified. Several of the cases that have been operated upon I believe might have been benefited, in all probability, by the proper application of mechanical means, and even some, where mechanical measures were employed, were operated upon too soon to determine the probable results. It is possible, however, to formulate certain principles which should serve as a guide until a larger number of cases enables us to determine upon fixed rules.

The operation is naturally contra-indicated.

- I. In cases where there are other complicating tubercular ions.
- 2. In cases where mechanical treatment has not been applied.

It is indicated:

 In cases where posterior spinal disease is made out as the cause of the paraplegia.

- 2. In cases where the lesion seems to indicate the failure of mechanical treatment, i. e., where dislocation has occurred or where a sequestrum is causing the compression.
- 3. In cases where during the employment of intelligently applied apparatus the symptoms continue to increase in severity.
- 4. In cases where after a certain period of careful mechanical treatment, say eighteen months, the condition has remained stationary.
- 5. In cases where pressure myelitis threatens the integrity of the cord.

In all cases where sinuses lead down to, or can be safely straightened so as to allow the probe to explore the abscess cavity with which they communicate, they should be enlarged so as to provide thorough drainage, and if sequestra are present they should be removed.

I should incise and treat all abscesses connecting with the spine, approaching near enough to the skin to allow of their being opened without a dangerous dissection; they should be then explored, washed out, and drained.

Although the statistics of the cervical cases are slightly less favorable than those of the other regions, the dangers to life even without operative interference are also greater. One of the cervical cases died from inhibition of the phrenic nerves. In this case the disease was localized at the third and fourth cervical vertebræ and in order to determine the presence or absence of an abscess or tumor in the cord, exploratory puncture was resorted to. The result emphasizes the dangers of interference with the cord where the lesion is at the level.

At the same time in disease in the cervical region there is constant danger that the pachymeningitis will extend upwards and by making pressure about this area of the origin of the phrenic nerves cause respiratory difficulties. In my opinion, therefore, whenever there are any indications that the inflammatory conditions are extending towards this portion of the cord, operation should be undertaken at once. The opening of the spine may be sufficient to avert the dangers due to phrenic disturbance and of course there is the strong possibility of the total arrest of

the process. The urgency of the condition would render the operative treatment advisable even though the results were more unfavorable than they are.

In conclusion, I must thank Dr. Schede of Hamburg, Mr. Arbuthnot Lane, Mr. Davies-Colley and Dr. Bowlby, of London, Mr. Norman Porritt, of Huddersfield, England, and Drs. Phelps, Abbe, Gerster, and Wyeth, for placing their cases at my disposal. Several of the cases have never before been reported, and in many of those that have been published I have been able to obtain later data.

The case reported by Chipault as having been operated upon by Chairman, proves upon investigation to be one of the eight included in Dr. Robt. Abbe's paper on Spinal Surgery, to which he referred when this subject was being discussed in the Surgical Section of the Academy of Medicine of which he was chairman.

Operator.	Region.	Duration of Disease,	Age and Sex.	Symptoms.	Operation.
1. Heine.					,
2. Holscher.					
3. Duypuytren.					
4. Jackson. 1882.	Dorsal,	Six months.	Twelve years. Male.	Third month paraly- sis and wasting of lower limbs; deep reflexes ex- aggerated; straining in micturition; no sensory troubles. Sixth month angular curvature tonic spasm of limbs; anæs- thesia; incontinence of urine.	dorsal vert, dura ex- posed but not opened; "spinal cord rose to the opening made in the bone."
5. Israel. 1882.	Dorso- lumbar.		Thirty- four years.	plete loss of reflexes:	Opening posteriorly made into spinal canal and part of twelfth dorsal body and intervertebral cartilage between it and first lumb. removed; pus evacuated and a sequestrum removed.
6 Macewen. 1883.	Dorsal.	Three years in plaster jacket.	Nine years, Male.	sensory paraplegia; in- continence of urine and fæces; (eighteen to twenty-four months)	Resection laminæ fifth, sixth and seventh, dorsal vertebræ; no pulsation in cord; thick connective tissue dis- sected off back of dura when cord began to pulsate.
7. Macewen, 1884.			Female.		Removal of dense connective tissue between the theca and the bone and part of adherent theca; cord shrunken without pulsation; removal of laminæ until pulsating cord exposed.
8. Macewen.					
9. Macewen.				Pyrexia due to tuber- culosis.	
10. Macewen.	ė ,		THE PROPERTY AND THE PR	Ibid.	
11. Southam. 1885.	Dorsal.	Few days.	Six years, Male.	Angular curvature; absolute motor and sen- sory paralysis; respira- tory troubles; fever; apparently dying.	dorsal laminæ giving exit to about fifteen

Subsequent Course.	Result.	Remarks.	Reference.
			Ashurst, Injuries to the Spine.
			Ashurst, Injuries to the Spine.
			Ashurst, Injuries to the Spine.
Wound healed fifteen days; in week could micturate properly; painful tonic con- tractions had disappeared: could draw knees up to abdo- men, move toes and feel throughout limbs.			Atken, Brit. Med Journ , 1883. Vol. I., p. 812.
Fever ceased; no improve- ment in parapleg:a.	Death thirty-seven days.	Empyema caused by infec- tion from a perforation in pleura during resection of twelfth rib in tracing up the abscess to the bony focus,	Berliner Klin. Wochenshrift, March 6, 1882.
Twenty-four hours, limbs warmer and less rigid returning sensation; eight days movements in limbs and control over sphincters; six months could waik without support; five years could walk five miles, play football, etc.	Recovery.	Between the theca and the bone a fibrous neoplasm one- eighth inch in thickness, and firmly attached to it and covering about two-thirds of its circumference was found.	Brit. Med. Journ., 1888, Vol II., p. 308, Case I Ibid, 1886, Vol. I. p. 40.
Ten hours, limb warmer, less livid and with subjective sensations; fourth day, continence urine and faces; sensation returned quickly, motion slowly; eight months, could walk, one-fourth mile; Four years, still well.			Ibid, Case II.
	Recovery.		Ibid, Case III.
	Death possibly hastened by opera- tion, occurred in one week.		Ibid, Case IV.
	Unimproved; death some months later; general tuber- culosis.		Ibid, Case V.
Temporary improvement in respiration; broncho-pneumonia.	Death in twenty- four hours.		Brit. Med. Journ., 1888, Vol 11., p. 665.

Operator.	Region.	Duration of Disease,	Age and Sex.	Symptoms.	Operation.
12. Horsley. 1888.		Twenty months.	Sixty- two years. Male.	Complete paraplegia and pain.	
13. Horsley. 1889.		One year,	Fifteen years. Female,	Complete paraplegia and pulmonary tuber- culosis.	
14. Horsley. 1889.		Five years.	Twenty three years. Female.	Paraplegia five years.	
15. Horsley. 1889.		Three years.	Sixteen years. Male,	Paraplegia and weak- ness of left arm.	
16. Horsley. 1889.		Eighteen months.	Sixteen years. Male.	Paraplegia,	
17. Horsley. 1889.		Eight months.	Seven- teen years. Male.	Paraplegia.	
18. Horsley. 1888.	Cervical.	Eleven months.	Fifteen years. Male.		Removal of second and third eervical arches.
19. Wright.	Dorsal.	Under treatment six months.	Seven years. Male.	mid-dorsal region; par- esis, etc.; later spastic paralysis of lower limbs; anæsthesia as high as eleventh rib;	Resection three prominent arches; lower part of exposed theca covered with leathery substance, which was cut away; no pulsation of cord; no constriction found,
20. Duncan, 1888.	Dorsal.	Twenty- one months.	Four years. Boy.	mid-dersal region; spastic paralysis almost	Resection, of fourth, fifth, sixth and seventh dorsal arches; membranes adherent to bone by granulation issue which was scraped away; dura white and smooth; faint pulsation then observed; plaster jacket.
21 Abbe. 1888.	Dorsal.	Five months.	Two years, Male,	tebra; temp, hectic; swelling contains pus; partial loss of motor	removal eighth, ninth and tenth dorsal arches which were carious. Dense mass connective tissue and derritus scraped away from pos- terior part of dura.

Subsequent Course.	Result.	Remarks.	Reference.
	Death in six weeks, exhaustion.	Large abscess in front of vertebral bodies.	British Medical Journal 1890, Vol. II. Page 1289.
Bony abscess; return of ensation in ten days; could walk in July, 1889.	Recovery.		Ibid.
Improvement of motion and sensation,	Improved.		Ibid.
In statu quo.	No improvement.		Ibid.
Improvement, motion and ensation.	Improved.	Abscess in bone,	Ibid.
Very slow improvement in notion.	Improved.		Ibid.
Wound healed; movement of legs on eighth day; of trms later; rapidly regaining power.	Recovery.		Med. Chir. Trans., Vol. LXXI., 1888, p.
Twelfth day returning sen- ation, spreading down limbs; wenty-seventh day sensation o left foot and right knee; fiteenth day flexion of thigos possible; fifty-first day re- apse and in few days as bad is ever.		After six months no change, theca surrounded by a buff-colored, tough leathery substance.	Lancet, July 14 1888, p. 64-66.
Third day move ankles and recognize a touch; seventh day moved knee; four-centh day move both limbs; anæsthesia overcome; three and half months walked little with spastic gait; sensation good.			Edin. Med. Journ., March, 1889, p. 829.
One week sensation began to return; four months gen- eral health good, could walk with chair; improving.	Recovery.	Still well February 1, 1891.	N. Y. Med. Journ., Nov. 24, 1888. Thorburn l. c., p. 166. Per sonal communica- tion, February 1 1891.

	Operator.	Region.	Duration of Disease,	Age and Sex.	Symptoms.	Operation,
22.	Abbe, 1889.	Dorsal,	Four months.		pleurisy and then fis- tula in ano; slight phthisical changes apex left lung; lumbar	out without injury to dura,
23.	Deaver. 1888.	Cervical.	Four months.	Forty- five years. Female.	aggerated deep reflexes on both sides; no an-	Removal of carious third and fourth cerv. arches; dura adherent to bone and thickened; exploring needle intro- duced into it with no result.
24.	White, 1888,	Dorsal,	Nine months,	Adult. Twenty three years.		1
25.	Dercum and White, 1888,	Dorsal.	Ten months.	Fifty- five years. Male.	and anæsthesia below	Removal first, second, third, fourth and fifth dorsal lam.; dura opened and adhesions between cord and dura broken up.
26.	Demons, 1888.	Dorsal,		Thirty- five years.		Removal third, fourth and fifth dorsal verte- bræ.
27.	Wright. 1889.	Dorsal,		Ten years.	Same case as No. 18.	Removal some more arches; bony frag- ments implanted,
28.	Bullard and Bur- rell, 1889.	Dorsal.	Seven and one- half months.	Forty- six years, Male,	buttock; sloughs at	laminæ third, fourth, fith and sixth dorsai; cord flattened and no pulsation opposite fifth vertebra; laminæ returned to place.

Still well Feb. 1, 1891 aree days. Death attributed to it to region of phremic nerv	Abbe, N. Y. Med. Record, July 26, 1890, p. 85. Personal communication, Feb.
to region of phrenic nerv	
needle, P. M.—Compres hemorrhage and degener of left side of cord due to flammatory growth.	es by Med. Sc., Dec., ssion, 1888, Thorburn, ration Spinal Surgery, p.
Tuberculosis, ether amyloid kidneys.	Annals of Surgery, June, 1889.
re.	Ibid, July, 1890, p. 37.
ath. Compression of cord discovered at operation.	Princeteau: Bull. Soc. Anat and Phys., Bordeaux, Vol. LIX., 1888, p. 288.
ieved.	Thorburn, l. c. p.
	Transactions Amer. Ortho. Asso., Vol. II., p.
	amyloid kidneys.

	Operator.	Region.	Duration of Disease.	Age and Sex.	Symptoms.	Operation,
29.	Wyeth, 1889.	Dorsal,	Two and one-half years	Nine years. Male.	fifth and sixth dorsal spines; complete para- plegia; vesical paraly- sis; voluntary defeca- tion; sensation nor- mal: urethritis and	Removal fourth, fifth and sixth dorsal laminæ; dura tense beneath right lamina of fifth; intradural tumor, one half inch perpendicular measurement; contained pus which was evacuated.
30.	Gerster.	Dorsal.	Long standing.	Four- teen years. Male.	Complete paraglegia; pain; difficulty in controlling rectum and bladder.	Removal laminæ sixth and seventh dor- sal vert.; extensive extra- and sub-dural abscess evacuated; extensive caseation of soft tissues adjoining inter-vertebral focus in which imbedded roots of motor and sensory nerves on both sides; transverse pro- cess of fifth, sixth, seventh and eighth thoracic vert. on right thoracic vert. on right and fifth, sixth and seventh on left carious and costo-vertebral joints destroyed; these and heads of corres- ponding ribs removed; bodies sixth and sev- enth vert, much dis: ntegrated and were gouged out.
31.	Bates. 1889.	Cervical,				Removal laminæ; fifth cervical,
32.	Arbuthnot Lane. 1889.	Dorsal.	One year.	Male, Seven and one- half years,	Paralyzed eleven months; curvature about fifth dorsal ver- tebra,	Removal spinous processes and laminæ fourth, fifth and sixth dorsal vert.; body of fifth appeared abnor- mally near laminæ of adjoining vertebræ and cord seemed forcibly compressed between these bony points.
33.	Arbuthnot Lane. 1890.	Dorsal.	Two years.	Male. Thirty- two years.	Analgesia both sides; anæsthesia almosi complete; reflexes ex- aggerated.	Removal spinous processes ninth, tenth and eleventh dorsal vertebræ and extra- dural granulation tis- sue and pus.

Subsequent Course.	Result.	Remarks.	Reference.
March, patient walking about; Jan. 24, 189x, is reported to be perfectly cured; Sep. 3, 189x, "able to go through all the ordinary movements of the lower extremities."	Recovery.		Inter. Journ. Surg., 1890, April Personal commu- nication, January 24, 1891. N. Y. Med. Jour, Sept. 3, 1891.
No immediate improve- ment in paralysis; three months later however rapid improvement; able to sup- port himself without aid; seventh month discharged from hospital; still small sinus.	Improved.		Personal communication.
	Death in four days.	Nothing found at operation but at autopsy caries of fourth and fifth vertebræ.	Richardson; Brooklyn Med. Journ., 1889, Vol. III., p. 401.
Month after operation could move both legs freely.	Cure.		Brit. Med. Journ., April 20, 1889.
Improvement began in twenty-four hours.	Cure.		Lancet, July 5, 1890, p. 11.

Operator,	Region,	Disease.	Age and	Symptoms,	Operation.
Орегания,	region,	Duration	Sex,	Dymptons,	Operation.
34. Arbuthnot Lane, 1890.	Dorsal.	Three years.	Male, Sixteen years.	and muscles paralyzed and reflexes absent; knee and ankle clonus very marked; no plan- tar reflex; sensation as high as sixth rib im- paired, but only absent around left knee; spin- ous process fifth dorsal formed apex of abrupt angular curve; occa-	fourth, fifth and sixth dorsal vertebræ; cord splayed over wall tense abscess cavity which appeared on cut surface; curdy material evacuated through incision; cavities in and about bodies of dorsal vert, as large as tangerine orange containing caseous matter and
		8.			comparatively large fragments necrosed bone which were re- moved; cavity filled with iodotorm emul- sion; drainage tube.
35. Arbuthnot Lane.	Dorsal.	Four years.	Female. Twenty one years.	larged gland appeared in neck; about same time fell down stairs, hurting back; two months later pain in back and inability to sit up; rest in bed few weeks overcame disability and pain; two and one-half years ago prominence in back; right knee joint swollen and painful; lost power right leg and then motion impaired; later same result established in left leg; seven weeks recumbent position no benefit; pulpy change right knee and slight backwards dislocation; prominence just below centre dorsal spine; tenth dorsal and subjacent vert. region in plane in front of ninth	tenth and eleventh dor- sal vertebræ; cord forcibly compressed be- tween body of tenth and laminæ of elev- enth; an abrupt and considerable change in its antero-posterior diameter being ob- served in consequence; drainage for forty-eight hours.
				dorsal; feet blue and cold; no motion of legs and no sensation; plan-tar reflex; ankle clonus and depressed patellar reflex left side; none on right; no hyperæsthesia; abdominal reflexes fairly well marked.	

Subsequent Course.	Result.	Remarks.	Reference.
ensation and motion returned apidly; marked improve-	lapsed; not benefit- ed; June 6, 1891 only slightly benefited; died of influenza and pneumonia.	A second operation showed cord surrounded by abundant caseous material which extended into muscles and neighboring parts for considerable distance; as much as possible removed without much benefit; operated upon a third time and benefited slightly; destruction of bodies then most extensive.	1891, Vol. I. p. 1227.
			•
ble improvement though pa- tient insisted limbs felt dif- ferent than before operation;	operation then relapsed and after second operation, "recovered complete voluntary control over legs;" cure; died in 1831 of pulmonary phthisis; no return of paraplegia.	Twenty-five days after first operation, pulpy right knee excised with excellent result; five months later paraplegia returned rapidly with cystitis; cord exposed at once and found splayed out over abscess from which much pus, curdy material and carious bone was evacuated and which involved bodies of three vertebiæ; daily injections iodoform and glycerine emulsion through metal drainage tube, which was removed after several weeks.	Journ., 1891, Vol. I., p. 1227, Personal communication, March, 1892.

Operator,	Region,	Duration of Disease,	Age and Sex.	Symptoms.	Operation.
36. Arbuthnot Lane. 1890.	Dorsal,	One year.	Four	a month before admission to hospital and became almost complete in four days; fifth dorsal vertebra summit of kyphos; four months later incontinence of urine in spite of continued enforced dorsal decubitus; sensation only slightly impaired;	by wall of large abscess which seemed to in- volve the bodies of the vertebræ and to extend into the thorax; it was
37. Arbuthnot Lane.	Dorsal.	Five years.	Male, Twenty three years.	months and then para- plegia five years ago; recovered power in legs after recumbency for fifteen months, but since suffered from deep seated pains in thorax; partial para- plegia returned three months before admis-	Cord compressed by wall of abscess which was very extensive and extended into the chest where a cavity was found nearly as large as an orange, the walls of which were in great part bony, showing that the first paraplega was relieved by the abscess extending into the thorax where it became encapsulated.
38. Arbuthnot Lane. 1891.	Dorsal.	Three months' deformity.	Male. Seven years.	rapidly became pretty complete; sensation	Sixth dorsal vertebra was centre of curve; laminæ removed and large abscess compress- ing cord and extending into the bodies of sev- eral vertebræ found.
39. Arbuthnot Lane. 1891.	Dorsal,	Two years.	Female. Five and one- half years.	Incomplete paraplegia; very feeble, deli- cate child; mid-dorsal curve.	Cord found com- pressed by a very large abscess which entered freely into the thorax; much necrosed bone removed; destruction of vertebræ being very great.
io, Arbuthnot Lane. 1891,	Dorsal.	Three years.		three years and para- plegia three weeks which was almost com- plete at time of opera- tion; extensive dorsal curve, miserably deli- cate child.	tending into thoracic cavity for considerable distance; cleaned and filled with iodoform-

Subsequent Course.	Result.	Remarks,	Reference.
Progress very satisfactory for five days.	Death from hemor- rhage from rectal po- lypus; while spinal condition progressing satisfactorily.	Purge given five days after the operation; next morning a hemorrhage into the bowel from a rectal polypus, caused death in spite of all precau- tions.	Personal communication.
He can use his legs with	Cure.	If As for as his consolution	Personal
perfect freedom, but his health is very delicate.	cure,	"As far as his paraplegia is concerned, he is practically well."	communication.
Recovered rapidly and completely.	Cure,	"Has had no recurrence of the paraplegia and the spinal caries is also apparently quite cured."	Personal communication.
	Death in a few hours.		Personal communication.
"Recovered power in his legs rapidly and completely."	Cure.	"Saw him to-day (March 14, 1892) and found that a small sinus had formed over the curvature, but he could walk as well as ever."	Personal communication.

Operator.	Region.	Duration of Disease.	Age and Sex.	. Symptoms.	Operation.
41. Arbuthnot Lane.	Dorsal.	Two years.	Male. Seven- years.	History of disease for two years and of paraplegia for five weeks, the latter coming on very rapidly; incontinence; fifth dorsal vertebra forms summit of the curve.	Large abscess com- pressing cord.
42. Arbuthnot Lane, 1891.	Dorsal.	One year.	Male, Seven years.	Paraplegia for one month; sensation much-impaired.	Extensive a mount caseous or curdy material compressing front of cord and involving the bodies of third and fourth vertebra, and only apparently affecting their posterior surfaces.
43. Thompson. 1889.	Dorsal.	Six years.	Fifteen years. Male,	Complete motor par- alysis below third rib; sensibility retarded; deep reflexes exagger- ated superficial reflexes abolished; no bladder or rectal symptoms.	dersal; pressure on cord from curve.
44. Colman.	Dorsal,	Eighteen months.	Sixty- four years. Male.	Complete paraplegia and anæsthesia to level of umbilicus; no control over sphincters; reflexes exaggerated; knee jerks exaggerated; no ankle clonus.	
45. Kraske,	Dorsai.		Thirty- three years.		Removal of three dorsal arches.
46. Kraske.	Dorsal.		Fifty- seven years. Female.	Caries of the fifth dorsal vertebra; para- plegia.	
47. Kraske.	Dorsal.		Four- teen years, Male,	Complete paraplegia; vesical paresis; marked curvature at fifth and sixth dorsal vert.	and sixth dorsal vert.

Subsequent Course.	Result.	Remarks.	Reference.				
"Recovered power com- pletely,"	Cure.	"Saw him a fortnight ago; found no recurrence of spinal caries which was apparently well."	Personal communication.				
Improved for a time and relapsed.		Second operation followed by no good result, sent out without having derived any benefit; recurrence of tuber- cular material very rapid and extensive.	Personal communication.				
Six months recovered so completely that he could run and jump and even stand on head.		Died of pneumonia nine months later. P. M.—small abscess cavity containing pus.	London Lancet, 1889, Vol. II., pp. 315-316.				
Nine days after the opera- tion sensibility began to re- turn, no improvement in motion.	exhaustion,	Cord compressed by mass granulation tissue; bodies eighth and ninth dorsal vert, completely excavated; large chronic abscess anteriorly; intense myelitis at point of compression and disorganization not complete as on long, section axis cylinders traced; well marked descending degeneration in part of median and adjacent part of post-external column in direct cerebellar tract and in the ascending lateral tract of Gowers; well marked neuritis of roots at point of compression extending down into nerve trunk.	Lancet, February 22, 1890, Vol. I., p. 402.				
No improvement,	Death in eight weeks.	Extensive ulceration of back. P. M. — Very extensive pachymening;tis; all compression not removed although three arches resected.	Centralblatt f. Chir., 25, 1890.				
Afternoon sensation in legs; four days patient could move left, and a few days later right leg; four weeks tried to walk.	Cure, then recurrence after two months.	Death seven months later; tuberculosis; recurrence due to compression below sixth vert.; pachymeningitis at former level completely cured.	Ibid.				
Some hours after could move limbs; two months later relapse to complete para- plegia.	-		bid,				

Operator,	Region.	Duration of Disease,	Age and Sex.	Symptoms.	Operation.
48. Kraske,	Dorsal.		Thir- teen years. Male.	Complete motor and sensory paraplegia; vesical paresis; curve at level of eighth and ninth dorsal.	Removal eighth, ninth and one other arch.
Chipault. 1890.	Dorsal.	Fourteen months.	Nine years. Male,	Complete paraplegia; curvature apex seventh dorsal; superficial and deep reflexes exagger- ated; no vesico-rectal difficulty; no anæs- thesia.	seventh and eighth dor-
50. Chipault. 1890.	Dorsal,	More than one year.	Nine years, Male,	region including six	fifth, sixth, seventh and eighth dorsal laminæ; fifth carious and mem- branes adherent.
51. Chipault.	Upper dorsal,	Six months.	Male, Nine years.	and seventh dorsal ver- tebræ, a cute angled curve, inclining to the left; compensatory lum- bar scoliosis; atrophy lower extremities; slightest touch causes limbs to be violently lexed; patellar reflex exaggerated; cremas- teric reflex lost; anæs- teric reflex lost; anæs- teric reflex lost; anæs- teris complete up to umbilicus: no hyper- exsthesia; no cystitis; no in continence of fecces: symptoms in-	Removal five arches, (second, third, fourth, fitth and sixth dorsal) after reflecting the periosteum; the meningeal coverings normal except at space of about seven cent imetres where it is pressed backwards, deprived of its fatty envelope, flattened, congested and bent; at this point a bony projection could be made out; the cord was separated and raised at the level of the third dorsal vertebra, where pus escaped; the bony projection was cut away enormous destruction vertebral bodies; complete section of the cord at this level.

Reference.
id raise limbs from Centralblatt Chir., 25, 186 crelapse, improved tacket; five months ove limbs but not
Révue de Chirurgie, Oct., Nov. ai Dec., 1890,
pneumonia; cica- adherent to mem- removed portion or portion; third process and left fourth dorsal were d continuous with process of the he fifth, sixth and which were com- stroyed; fourth, I ninth also de- part; separated nited by caseous ining two seques-
The site of opera- di in by thin shell sixtol greal exami- costeo periosteal; letely severed at e bony projection ed; complete de- the first, second, th and fifth dorsal
,

Operator,	Region.	Duration of Disease.	Age and Sex.	Symptoms,	Operation,
52. Chipault.	Upper dorsal.	Four	Femala and one-half years.	fourth and fifth dorsal spines and two or three adjacent processes; extension of thigh only retained; electrical reaction practically normal; no anesthesia; no trouble with sphineters; ankle clonus marked, particularly the right; exaggeration patellar reflexes; cutaneous reflexes nor-	arches and articular processes up to the pos- terior part of the pedi- cles and the articular processes, and between the fourth and fifth pair of nerves a consider- able number of fungous granulations and a doz- en sequestra of the size of a cherry pit; all came from the post, part of fourth body; drain introduced into the vertebral cavity;
53. Chipault,	Upper dorsal.	Three or four months.	Male.	including first, second and third dorsal verte-	nerves; upon its re- moval escape of con- siderable pus; two fis- tulæ lead into the body of first and bodies of the second and third vertebræ; these clean- ed as theroughly as possible; fungous gran- ulations removed from
54. Page. 1889.	Dorsal.	Five years,	Twenty years. Male.	paraplegia, limbs wasted and a spassic, sensation diminished as high as 'lumbar back and lower abdomen;' occasional incontinence of urine; curvature extending from fifth to tenth dorsal vertebræ; some symptoms of secondary degeneration apparently present.	seventh and eighth dor- sal vertebræ; firm ankylesis of all bony parts which were sclerosed; chisel and mallet used to complete opening in canal during which there were mus- cular twickings of less
55. Podres.	Cervical.			Paralysis.	Removal sixth and seventh cerv. bodies.

Tribble of Choles.				
Subsequent Course.	Result.	Remarks.	Reference,	
Improving.	Improved.		Révue de Chirurgie, November, 1891.	
Improvement remarkable and rapid; in six hours could raise both heels from the bed; the paralysis seemed to have entirely disappeared; reflexes normal next day; pains of arm gone on fourth day.	Cure.		Ibid.	
Day after and for six days urine had to be drawn by catheter and then passed involuntarily and without sensation; slight cystitis two days after operation, tickling sensations in both legs and soles and twitching muscles of right leg; this disappeared about sixteenth day; knee jerks less exaggerated; ankle clonus less; no voluntary power; finally could walk.	Improved.		Lancet, December 6, 1890, Vol. II., p. 1210.	
	Recovery.		Russkaja Med. No. 19, 1886, Ther. Gaz., Octob- er 15, 1891. White.	

Operator.	Region,	Duration of Disease,	Age and Sex.	Symptoms,	Operation,
56. Borchel.	Dorsal.		1 5		
57. Buffet.	Lumbar.				*)
58, Therburn.	Dorsal.		Six years,	Pott's paralysis,	Removal laminæ of third dorsal vertebra, making opening of size of sixpence in spinal canal; escape of about fifteen minims pus; ap- parently healthy dura at bottom of wound; drainage tube inserted into spinal canal and wound sutured.
59. Schede.	Cervical.	Eleven months.	Female, Fifteen years.	symptoms in spite of careful treatment until paralysis complete in all four extremities; sensation retained; reflexes decreased; in- continence of urine and fæces; bed sores on	with mallet and chisel and forceps: consider- able venous bleeding controlled by tampon and ligature; on right side of cord in region of fifth vert, dura was covered with granula-

Subsequent Course,	Result.	Remarks.	Reference.
	Recovery.		Schmidt's Jahr- bücher: Phila, Med. Times, Sept. 8, 1883, White.
	Recovery.		Gaz. des Hos- pitaux, December 2, 1886, White. Ibid.
Breathing distinctly im- proved after operation but no other change; following morn- ing improvement maintained but considerable pus in urine; no pus in dressing; afternoon of same day breathing again became much worse; tem- perature rose to 104.6°.	Death from asphyxia.	No autopsy.	Brit. Med. Journ., 1888, Vol II., pp. 665-666.
Next day greater loss of reflexes but two days later all were about normal; slight motion in toes, better in extension than flexion and on right than on left side; no longer complaining of pain; one month later slight improvement in motion but general condition worse.	days after operation.	Autopsy: The cervical spine was very prominent and the vertebral canal was narrowed by the bodies of the vertebra; the canal was occupied by a caseous mass filled with sequestra, which were adherent to the dura; the inner surface of the dura at this point was smooth and free; the cord was shrunken and softened but the nerve fibres could be made out on cross section; the fourth vert. was reduced to a caseous mass and the third projected towards the spinal canal and was turned on its axis so that its anterior surface articulated with the fifth which was only one-third its normal size owing to osteomyelitis; sixth and seventh cerv. normal but first and second dorsal confluent caseous focus, prevertebral abscess with caseous pus.	communication.

Operator.	Region,	Duration of Disease.	Age and Sex.	Symptoms,	Operation,
6o. Schede.	Dorsal.	Four, months.	Male, Four years.	Badly nourished child, with eczema face and phly ctenular kera- titis; careful treatment did not arrest dorsal spinal disease; finally great pain in legs and thighs; slight flexion of thigh is the only motion possible in the lower extremities; no hyperæsthesia; no anæsthesia; Trousseau's phenomena absent; patellar reflexes, left almost lost, right exaggerated; tendo Achilhs reflex weak on both sides; no ankle clonus; cre masteric reflex weak; reflexes in lorearm and triceps, weak on both sides; paralysis of bladder and rectum; very sharp prominence third and fourth dorsal vert.; skin ulcerated and inflamed over this region; lordosis of lower dorsal vertebræ; prominence of second and third lumbar vert; every prominence painful on pressure; no psoas abscess.	bræ; dur a smooth; cord pushed forward; dura above covered with gray-white granulations and a pseudomembrane so that after removing arches of second and first dorsal this membrane was removed with scissors; cavity filled with caseous material in body third dors; scraped out and two pea sized sequestra removed; cavity packed iodoform gauze.
61. Schede.	Dorsal.	Six months.	Male, Eighteen years,	and anæsthesia up to umbilicus, priapism; incontinentia urinæ et alvi; a slight promi-	cision through the soft parts at level of third vert.; whole left arch of third dorsal carious free pieces of bone easily removed; arches

Subsequent Course,	Result.	Remarks,	Reference,
During operation a great deal of blood lost from veins in periosteum. "On account of narcosis, (cnloroform) patient became cyanosed and asphyxiated;" half an hour after operation collapse; pulseless; no response to stimulation.	Death three hours after operation.	Autopsy: Caseous osteo- myelitis from first to fourth dorsal; involvement of sixth, seventh and eighth dorsal; prevertebral abscess in upper dorsal region to right and left of column; caseous lymphatic tuberculosis in anterior medi- astinum and at hilus of right lung; interstitial pneumona of upper and mi-dlelobes of right lung; "freining of upper part of dorsal spinal cord.	Personal communication.
Next day general condition good, no improvement in cord symptoms; second day complained of difficulty in chewing; fourth day Koch's lymph; no improvement in paralysis, anaesthesia, etc.; two months later pleurisy.	Death two months and a half after ope- ration; no improve- ment in symptoms before death.	Autopsy: Fistulous opening at upper part third dorsal vert. communicating gangrenous sequestrum and cavity size of herry pit; involving the left half of the fifth dorsal and the intervertebral cartilage; the fourth and fifth vertebrae were gangrenous and the cav.ty here opened into the left mediastinua; in this vicinity the dura was thickened and covered with gangrenous debris; membranous growth under the pia; cord between third and fith dorsal nerves greatly softened and atrophied and degenerated; tubercular empyema and pneumonia.	Personal communication,

Operator.	Region.	Duration. of Disease.	Age and Sex.	Symptoms.	Operation,
6a. Schede.	Dorsal.	More than one year.	Male. Twelve years.	one year symptoms continually growing worse until he had complete paraplegia; patellar reflex present more marked left side than right; ankle clonus; complete anæsthesia as high as umbilicus and hyperæsthesia from this point up to mamillary line;	eighth and ninth dorsal, escape of pus from spinal canal; cavity in body of vertebræ filled with sequestra; evacuated with sharp spoon; gray, white, caseous exudation over anterior surface dura; this removed with scissors; the cord although surounded by pus seemed of normal consistency; cavity drained and extension applied.
63. Schede.	Dorsal.	About five months.	Female, Five years.	motor paralysis lower extremities; sensation normal: tendon re-	
64. Schede, 1891.	Dorsal.	Almost three years,	Male. Six years.	of rigid contraction; short clonic spasms at intervals; patellar re- flexes present; slightest movement, even pas- sive, causes intensely painful tonic contrac- tion; sensation uncer- tain; no control over bladder or rectum; lor- dosis cervical region, sharp kyobesis includ- sharp kyobesis includ-	Removal arches second, third and fourth dorsal and spinous process first; thick, gray, red pseudo-membrane lying between the bone and dura; medulla pressed backward towards arch; no pulsation; left side under cord granular debris removed with sharp spoon; irrigation 1-1000 bichloride sol.; drainage.

	TABLE O	i Cholo.	
Subsequent Course.	Result,	Remarks.	Reference.
Sensation slightly decreased next day; second day reflexes exaggerated, improvement very slight and only temporary; general condition constantly grew less favorable.	Death two months after operation.	Autopsy: Tubercular osteo- myelitis first to seventh dorsal vert, eighth and ninth absent; caseous abscess; tubercular pleuritis, peri-pachymeningi- tis; tubercular infiltration spinal pia mater.	Personal communication.
		χ.	
Next day general condition slightly improved; no improvement in paralysis. P. M.—Collapse,	Death in collapse twenty-four hours after operation.	Autopsy: Purulent peritonitis; diphtheritic cystitis; pyelo-nephritis; phthisis pulmonalis, et gland, bronchial, fibrous red gray masses attached to dura in dorsal spinal canal, inner surface of dura smooth and free, cord itself normal except at lower half of operated portion where Goll's columns seem to be compressed; vert. bodies intact.	Personal communication
Slight collapse following the operation; evening rigidity of muscles less; extension knee without great pain; next day conscious of passage of urine, but not of fæces, bed sore healing; one month later no improvement but protuberant granulation mass site of operation; this was cleared away, more sequestrated ound in old cavity and evacuated and while this was being done a fresh prevertebral abscess opened; washed out bichloride solution and packed iodoform gauze, all symptoms slightly improved.	after operation,	Autopsy: Multiple tuber- cular osteo-myelitis dorsalis; bodies two, three, four, five diseased; caseous foci in all the other dorsal bodies; my- elomalacia dorsalis with as- cending degeneration of pos- terior section and margins of pyramids.	Personal communication

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Region.	Duration of Disease,	Age and Sex.	Symptoms,	Operation.
Dorsal.	Unknown.	Eleven years.	nipples; no improve-	Removal arches last cervical and first dorsal vert.; caseous pus es- caped from canal; cord appears atrophied; no sequestra found.
Dorsal.	Four months.		gibbus; second to fitth dorsal vert, very sensitive; fluctuating abscess both sides these vertebrae; complete paraplegia; reflexes increased; at times tonic convulsions; foot clonus; sensibility retained; sensibility retained; bladder and rectum normal; atrophy lower extremities marked; considerable diminution of constant and faradic excitability, especially in muscles; so in erves; no	Caseous abscess out open on both sides above dorsal fascia extending from the second to the eighth dorsal vertebral; no caries of the vertebral-riches; transverse processes also intact; removal third to seventh arches; dura thickened and transformed at points into fungous tissue, covered and traversed by caseous material; this was removed; pia exposed from third to seventh vert.; no cord lesion observable; extension and counter extension, Collapse.
	Three years.	Female. Four years.	Complete paraplegia.	
Fourth, fifth and sixth dorsal vertebræ.	One year.	Seven years, Male,	Partial paraplegia; pateliar reflex gone.	Removal laminæ of three vertebræ and much caseous material from bodies without reliet of the paraplegia; six weeks I ter laminæ of two vert. below removed and abscess found on the anterior surface of the cord; cavity washed with iodoform emulsion; drainage tube continued to discharge for some weeks.
Above middle of dorsal.		Seven years, Male,	Partial paraplegia; loss of control of arine,	Laminæ and spines of third vert, removed; large, curdy collections in part scooped out.
	Dorsal. Dorsal. Fourth, fifth and sixth dorsal vertebræ.	Dorsal. Unknown. Dorsal. Four months. Three years. Fourth, fifth and sixth dorsal vertebræ.	Dorsal. Unknown. Eleven years. Dorsal. Four months. Female, Fifteen years. Fourth, fifth and sixth dorsal vertebræ. Above middle of Three middle of seven years.	Dorsal. Unknown. Dorsal. Unknown. Female. Fifteen years. Dorsal. Four months. Female. Fifteen years. Female. Fifteen years. Three years. Fourth, fifth and sixth dorsal vertebræ. Fourth, fifth and sixth dorsal vertebræ. Three years. Fourth, fifth and sixth dorsal vertebræ. Female. Pain in back four months; could not walk eight weeks; no gibbus; second to fifth dorsal vert, very sensitive; fluctuating abscess both sides these vertebræ; complete paraplegia; reflexes increased; at times tonic convulsions; foot clonus; sensibility retained; biadder and rectum normal; atrophy lower extremities marked; considerable diminution of constant and faradic excitability, especially in muscles; less in nerves; no bed sores. Three years. Fourth, fifth and sixth dorsal vertebræ. Fourther fourth, fifth and sixth dorsal vertebræ. Female. Four years. Female. Four years. Famile. Pain in back four months; could not walk eight weeks; no gibbus; second to fifth dorsal verte, very sensitive; fluctuating abscess both sides these vertebræ; could not vertebræ; could not vertebræ; especially in could not walk eight weeks; no gibbus; second to fifth dorsal verte, very sensitive; fluctuating abscess both sides these vertebræ; could not walk eight weeks; no gibbus; second to fifth dorsal vert, very sensitive; fluctuating abscess both sides these vertebræ; could not walk eight weeks; no gibbus; second to fifth dorsal vert, very sensitive; fluctuating abscess both sides these vertebræ; could not walk eight weeks; no gibbus; second to fifth dorsal vert, very sensitive; fluctuating abscess both sides these vertebræ; could not walk eight weeks; no gibbus; second to fifth dorsal vert, very sensitive; fluctuating abscess to the side that the paraplegia; paraplegi

Subsequent Course.	Result.	Remarks.	Reference.
Subsequent Course,	Acoust,	Acmaras,	Reference,
No improvement.	Death ten days after operation,	Autopsy: Spondylitis second, third, fourth, fifth, sixth and seventh dorsal; pleural adhesions both sides, well marked growth at site of operation; myelitis, atrophy of cord in diseased region, many bedsores.	
No improvement.	No improvement; fourteen days after operation; still under observation,		Personal communication,
	Death from pneu- monia one month after operation,	Autopsy:	Personal communication. History compiled by Dr. Reeves, of the New York Post-Graduate Hospital.
Child worse after each operation.	Not improved.	The operation wounds healed up readily.	
No improvement.	March 16, 1892, child still bad, total paraplegia; so me evidence of tubercle in lung; died in nearly three months from tubercular men- ingitis.		Unpublished. Personal communication.

Operation.	Region.	Duration of Disease.	Age and Sex.	Symptoms.	Operation,
70. Bowlby,	Upper dorsal.	About two years.	Five years, Male,	Gradually increasing paraplegia, six months becoming complete, with loss of patellar reflex; urine passed normally; ditto fæces.	second to fifth dorsal
71. Norman Porrett.	Lower cervical and upper dorsal.	Eighteen months.	Forty- one years, Female.	Severe nocturnal pain between shoulders and down arms, thence spreading down back to legs; twitchings of feet; loss of power in legs, with spasm "spastic paraplegia;" bed sores; incontinence of urine; slight but undoubted angular curve of the spine at the vertebra prominens.	and opening abscess in front of spinal mem- branes.
72. Urban.				Temporary resection.	
73. Urban.		Two years or more.	Female, Five years.	Temporary resection.	
74. Lloyd.	Dorsal.			paraplegia, anæsthesia; incontinentia alvi et urinæ; prevertebral abscess with sinus; sinus into pleural	spinous ligaments when dura expanded and filled canal; pulsa- tion returned; canal probed above and be- low and found patent.
75. Israel.				Spondylitis with ab- scess and complete paralysis.	

Subsequent Course.	Result.	Remarks,	Reference,	
Healing by first intention; commencing return of power in eight days; walked in four months.	Cure,		Brit. Med. Journ., 1891, Vol. II p, 949. Personal communication.	
Death from hyperpyrexia eighteen hours after opera- tion.	Ceath,	Caries of the bodies of last cervical and first dorsal vertebræ was found after death, the caries being confined to the posterior aspect of the bodies; the first two dorsal vertebræ were firmly anchylosed by bony union almost in a straight line; no trace of abscess cavity outside the spinal column; at first sight the case appeared one of tabetic change in the spinal cord, and the almost total absence of local signs at a point where prominence of the spine is looked for was misleading.	communication,	
In both cases there was no pulsation in the membranes until the removal of the com- pressing portion of the verte- bral bodies.	Death.	•	Beilage zum Centralblatt für Chirurgie, 1892. No. 32.	
	Death,		Ibid.	
Gradual improvement in paralysis and anæsthesia; hoperation not undertaken until child thought to be dying; t general condition at first improved then bad again; before death anæsthesia re-established to a considerable degree, could raise left leg at right angles to bed; partial control over bladder and rectum.	Death from ex austion, three veeks after opera ion.	Autopsy: Large kyphos composed of all the dorsal vertebræ; two sinuses to left of median line one communicating with pleural cavity the other with prevertebral abscess, separated by a very thin fibrous septum. Cord and membranes normal. Operation not undertaken until patient's recuperative powers exhausted.		
Considerable improvement, the legs can be actively raised. Improvement did not how- ever set in until four months after the operation.	Improved,	Report received too late for use in the paper.	Beilage zum Centralblatt für Chirurgie, 1892. No. 32.	

THE TREATMENT OF GANGRENOUS HERNIA.

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NOTHING more clearly demonstrates the evolution of surgical thought and practice than a comparison of the questions deemed of prime importance in relation to strangulated hernia at the extremes of two decades.

Prior to 1870, the question to be answered in every case was, "Is the sac to be opened, or not." At present, a condition is hardly to be conceived in which the operator would refrain from opening the peritoneal tunic, thoroughly inspecting the hernial contents and wherever feasible supplementing the relief with the radical operation.

Taxis which then played so prominent a role in all cases has been accorded a more and more subordinate position as its dangers, ever increasing with the age of the strangulation, were more fully appreciated, and in proportion as surgery sought the light for its manipulations in large and open wounds. Then, the teaching of the German and English schools regarding gangrenous hernia prevailed. The oft-encountered sloughing gut was incised and permitted to drain as an abscess. Now the really vital lesson of kelotomy, that in its early performance lies its safety, has been widely learned. Therefore gangrenous hernias are becoming relatively less frequent. Of 27 cases which have come under my observation, only 4 were gangrenous. Three times have I seen gangrene of the intestines; once of the mesentery alone. In one of the former, the strangulation had existed less than 24 hours. Of 170 kelotomies for strangulation in Hagedorn's clinic (1) gangrene, real or suspected, was encountered but 25 times. In Göttingen König (2) had 49

strangulations in 5 years, gangrene being present in 8. Of 61 cases occurring over a period of 12 years in Czerny's clinic (3) 15 were gangrenous. Of 94 cases operated on in the Mass. General Hospital (4) 7 were gangrenous and 2 doubtful.

F. A. Southern (5), of the Manchester Royal Infirmary, reports 85 cases of hernia and among them 9 of gangrene. Thus of 486 cases occurring within about twenty years only 68 or about 14 per cent. were gangrenous or doubtful cases. Clearly, therefore, the experience with this condition of any one man, unless possessed of an unusual clinical material, must be limited. It is therefore by cumulative evidence that the proper management of this most fatal complication of hernia must be evolved. In this belief I venture on the report of the following cases:

Case 1. Walter P., æt. 29, farmer, Carlisle, Ky. Rupture of several years' standing. Truss worn, but irregularly. While at work strangulation appeared on the 1st of August, 1889. Continued work for some time and attempted reduction. After 48 hours Dr. Tilton was summoned but taxis failed. The necessity for an immediate operation was urged but it was declined. I saw the patient on the night of the fifth day. Abdominal distension marked. Obstipation; vomiting frequent but not feculent. Pain severe about umbilicus. Great restlessness. Temp. 102°; pulse 100, and full. Scrotal hernia size of fœtal head; hard and without impulse on coughing. Skin red and ædematous. Operation by lamp-light. In the hernial sac was fully a half pint of foul-smelling bloody serum. Omental mass as large as a fist; of dark-brown color, putrid and friable; no adhesions to sac. (The latter was a dusky blue in color). There was no intestine in the hernia. After carefully cleansing the sac and its contents and covering the protruded omentum in gauze, the constriction at the internal ring was divided. The omentum was easily drawn into the wound, after severing some slight adhesions. It was ligated and returned to the abdominal cavity. Thorough intra-abdominal drainage through the wound was provided for. Death 24 hours post-operationem from peritonitis. An autopsy was not made.

Case 2. Mrs. M. æt. 69. Hernia of 15 (?) years' standing. Has frequently had symptoms of fecal impaction. After a supposed attack of this kind had lasted three days, Dr. J. Marcus was summoned. I saw the patient in the evening of the fourth. There had been fecal vomiting for two days. Aside from a decided dyspnæa from which

the patient suffered at all times, the general condition was not good. There was no elevation of temperature. Pulse irregular.

The appended illustration displays the woman's femoral hernia. Large and lobulated it covered the entire upper and lower part of the thigh. Transverse measurement II inches; longitudinal 7 inches. The greater portion of the hernia was soft. In its depths there was an indefinitely outlined mass which was painful on pressure. Believing the case to be one of impaction within the sac and recognizing the gravity of an operation under the conditions present, the patient was anæsthetized with a view to operation if taxis moderately used did not overcome the difficulty. That I did not operate at once was a fatal error. With very little force gurgling was elicited and the mass before mentioned seemed to have subsided. After coming out from the narcosis, the patient's condition was found to be unrelieved. When I saw her next day, she was moribund. Exit lethal sixteen hours post operationem.

Autopsy.—On opening the sac it was found to be multilocular; the many diverticula evidently resulting from the lesser resistance of the meshes between the denser fibres of the cribriform fascia. The coils of intestine were for the most part as freely movable as in the abdomen. In one of the saccules an obstruction was found. It was produced by a band as large as a quill. It sprang by a broad base from the free border of a coil of intestine and was attached to the under surface of the mesentery of the same coil. In the loop thus formed a second coil had become entangled.

Above and below the constriction-furrow the bowel was normal. In the constriction groove itself a localized gangrene or rather pressure necrosis had led to a perforation. The aperture is about one-sixth of an inch in diameter; and on the free border of the intestine. There is no fecal extravasation.

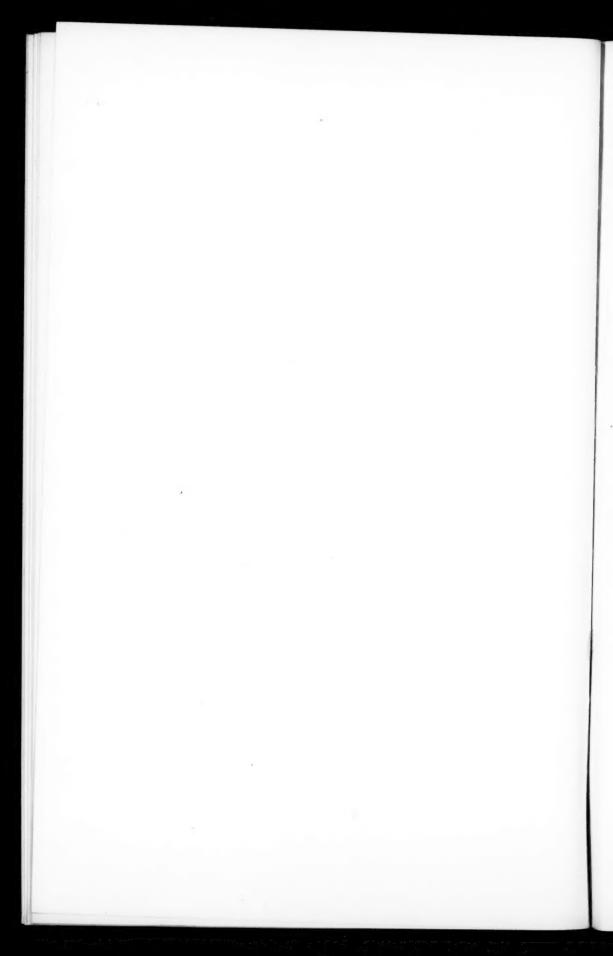
The band springs from the ileum about 14 inches from the ileocecal valve. It presents a central cavity which tapers off towards its mesenteric attachment. The character and position of the band make it certain that it is a Meckel's diverticulum. Though often producing acute intestinal obstruction in the belly cavity, I have not been able to find the record of a case where it had given rise to obstruction in a hernia. In this regard the case presented is unique.

Case 3. Miss D. at. 30. Seen with Dr. Jenkins, Newport. No previous history of rupture. While lifting a mattress felt something give way in the groin, four days before operation. Was seen



FIGURE 1.

Dr. Ransohoff's Case of Strangulated Femoral Hernia.



by Dr. Jenkins on third day, when taxis was attempted. Then vomiting became severe and abdominal pain intolerable. An operation was permitted, hernia large as a walnut. No impulse on coughing, not very tender. Absolute obstruction since inception. Abdomen not distended. General condition very good. On opening the sac several ounces of bloody serum escaped. There presented itself a knuckle of small intestine apparently of the ileum about four inches long of bluish color and moderate distension. The serous covering was glistening. In the centre of the coil opposite to its mesenteric attachment, there was a black gangrenous patch large as a silver quarter and circular in outline.

After carefully cleansing the sac wall and intestine, the constriction at Gimbernat's ligament was divided and then brought into the wound. Although the constriction-furrow was unusually deep there was no evidence of present or probable necrosis. The afferent bowel was considerably larger than the efferent coil, but presented a healthy appearance. Indeed, during the few moments that the hernial contents were being studied with a view to definite action the circulation returned to all of the gut save the gangrenous patch alluded to. It was finally determined to return the entire intestine to the abdominal cavity, retaining by two catgut sutures passed through mesentery and wound margins, the gargrenous surface in absolute relation to the floor of the wound. The latter was lightly packed with gauze, and a sterilized dressing applied over all. The vomiting continued for several hours. Ten hours after the operation the patient had several large and watery evacuations. On the fifth day perforation of the intestine ensued and during two weeks the large portion of the intestinal contents discharged through the fistula. Without other treatment than compression the aperture gradually contracted, and in a little over a month had entirely closed. The process of sloughing was unattended by either local or general reaction. The patient has since remained well.

Case 4. Mrs. K. seen with Dr. Harff. Patient, æt. fifty-six, was for many years the subject of an irreducible inguinal-labial hernia of the right side. Has repeatedly suffered from incarceration. Once reduction was accomplished under anæsthesia. While at work on Friday morning, she experienced a sudden and excruciating pain in the hernial protrusion and suffered immediately from nausea and vomiting. Saw the patient twelve hours after first symptoms supervened. The hernial protrusion, large as a cocoanut, was soft and resonant throughout. Impulse on coughing plainly perceptible

in many parts of the mass. From the base of the hernia projecting towards its surface a coil of intestine could easily be outlined and palpated. It was dense, hard and resisting; like a link of tightly-packed sausage in shape and to the touch. Diagnosis, strangulation by band; gangrene probable, notwithstanding the excellent general condition of the patient. It was nearly midnight when I first saw the patient, and necessary assistance was not at hand. The operation was therefore deferred until morning. During the intervening ten hours very extensive effusion into the sac had taken place. The constricted coil could no longer be clearly outlined.

Incision ten inches long in axis of tumor. On opening the sac some half dozen pouches connecting with it were exposed and in them were coils of bowel and adherent omentum. The sac presented the usual appearance of an old reducible hernia. In one of the compartments near the greatly enlarged ring a loop of the bowel had become fixed by a band. The sac, separated from the general cavity, when opened, discharged six or eight ounces of a foul, bloody serum. Within it was a coil of gangrenous bowel. Completely sequestering with gauze the infected area, the constricting band was divided and the sloughing gut brought into the wound for inspection. Along the line of constriction a deep groove had been formed but there was no necrosis. The coil itself was of a dark chocolate color and lusterless. Under its surface, which presented few abrasions, were many hemorrhagic extravasations, chiefly near the free border. Perforation had not taken place. Above and below the constriction groove the intestine seemed normal. The patient's general condition warranting the procedure, primary resection was determined on. Having thoroughly protected the wound, and brought the intestine well down, a gauze cravat was lightly drawn through the mesentery an inch above and below the constriction groove. Excision followed, the mesentery being divided a short distance from the gut and parallel to it. Hemorrhage from the mesentery was free, but no ligatures were required. As the mesenteric wound was brought together by a continuous silk suture beginning at its centre and including its entire thickness, the bleeding points were included within it. When completed the mesenteric suture line measured about four inches. this suture progressed the intestinal ends naturally approached each other. No clamp was used; the fingers of an assistant answered admirably. The ends were of uniform diameter. For suturing, fine silk and an ordinary cambric needle were used. The suture employed was the continuous Lembert. Particular care was taken at the mesenteric attachment. When completed the suture appeared weak at two points. These were fortified by additional sutures. The sutured bowel was returned to its sac, the wound thoroughly irrigated and closed except for gauze drainage at its most dependent portion. Time of operation, fifty minutes. Length of gut removed, fourteen inches. Union primary, and recovery uninterrupted. Nineteen months have passed since the operation; the patient continues well.

The first case presented is of interest in that the omentum is rarely involved in the sloughing process of a gangrenous hernia. B. Schmidt (6) questions altogether the existence of primary strangulation of the omentum. Of Hagedorn's 170 cases (7), gangrenous omentum was only once the sole occupant of the sac.

I have found reports of two other cases—one from Heidelberg (8); the other of W. H. Bennett (9) of St. George's Hospital. The safety of the omentum from gangrene is readily found in the ease with which it forms adhesions to the sac wall through which it then receives its nutrition. The case first reported appears to me to put a quietus on the theory long advocated and recently again promoted by Banks, namely, that the constriction ring should not be divided in most cases of gangrenous hernia on the ground that it is a bar to the development of general peritonitis. By the constriction the septic products of the hernia may be isolated for a time. But peritonitis developes from within. In the case presented there was no communication between the sac and the general belly cavity, but just within the neck was the large gut fixed by the adherent omentum, and its wall rendered paretic through traction was unable to resist the passage through it of the organisms which fatally infected the peritoneum. Fortunately there can be but one opinion as to the management of gangrenous omentum. Excision after ligation in healthy tissue, and return to the peritoneal cavity will generally end in recovery unless peritonitis already exists. The three cases quoted all recovered, although in each the radical operation followed that for strangulation. The wisdom of this procedure in all cases might be seriously questioned. In severe cases where peritonitis already exists or is threatened, the last step might advisedly be refrained from and thorough drainage secured. At all events, capillary drainage through gauze can never be harmful. It may be relied upon to forestall the development of

a peritonitis, and where the process already established is yet local, avert a fatal issue.

When gangrene involves the intestine, the solution of the problem is far less easy. Since Ramdohr first successfully resected the gut for hernia in 1727, the possible success of primary excision has been conceded.

Of recoveries there have been many. But the measure, however ideal, has never gained firm footing among surgical procedures. This in face of the fact that the results from the alternative measure, that of the formation of an artificial anus, have been most deplorable. Recently Poulsen reports 29 cases, (10) with but 4 recoveries. Of 35 cases as treated at St. Bartholomew's, 4 were saved (Brit. Med. J., June, '91, i. p. 701). Certain it is that all cases should not be treated alike and that every case ought to be considered with reference, first to the condition of the intestine and its environments, and second the probable ability of the patient to bear the shock of a prolonged operation.

In three of the cases presented many of the changes except those of the afferent portion of the bowel were found. For a strangulation affects the gut either along the line of constriction, at some or all points of the coil involved or in the course of the intestine for a varying distance above the point of constriction. Where the constricting band binds the gut, a well marked groove is made by direct pressure. The constriction, tight enough to occlude the calibre of the bowel, may not interfere with its vascular supply. If gangrene results it will be from pressure at the bottom of the groove and limited in extent. Except for the usually small ulcer in the constriction groove, the gut above and below may be normal in appearance. In the fruitless efforts of nature to protect the general peritoneum, adhesions are quickly formed between bowel and neck of sac. In the attempt to sever these the fragile wall of the bowel tears along the line of constriction. Doubtless many cases of this kind occur, the fecal outpour taking place at the time of the operation. To avoid this it might be wise to follow the practice of Mikulicz (11), who in every case of suspected gangrene opens the ring from within the belly cavity, thus making a laparo-kelotomy which permits as he thinks thorough isolation by gauze of the infected area.

The difficulty appears in the fact that pressure gangrene limited to the furrow and made by the constricting band is not always easily recognized. Fortunately the tissues about it, whether torn by manipulation or not, are in a fair condition for partial excision and lateral suture, by which the patient may be saved the perils and annoyance of an artificial anus. Krumm reports such a case successfully treated, and Barette three of pressure gangrene successfully managed in the same manner. The deleterious effects of strangulation are not equally visited on all parts of the coil. In some cases, as in the fourth presented, the entire knuckle is of dull chocolate or grayish color, with or without subserous hemorrhages. It is soft, friable, gangrenous throughout. In others, as in the second, the force of the strangulation although influencing the circulation of the whole, appears to affect most seriously the central part of the knuckle and at a point removed farthest from the mesentery. It is clear that if in such a case excision were to be done it could only be beyond the limits of constriction. The cyanotic gut about the really gangrenous centre would ill support a suture. Let alone, it will recover. The handling incident to suture might easily prevent it. Furthermore in cases of this nature the gangrene is often more extensive than is apparent. Beginning generally in the mucosa. the serous tissue is the last, and therefore least affected. The fixation of the gangrenous area in the bottom of the wound, relying on nature to make the anus preternaturalis appears to me sound judgment. The data on which this view is based differ from those which militate against the formation of a fecal fistula when the gut is gangrenous in its entirety.

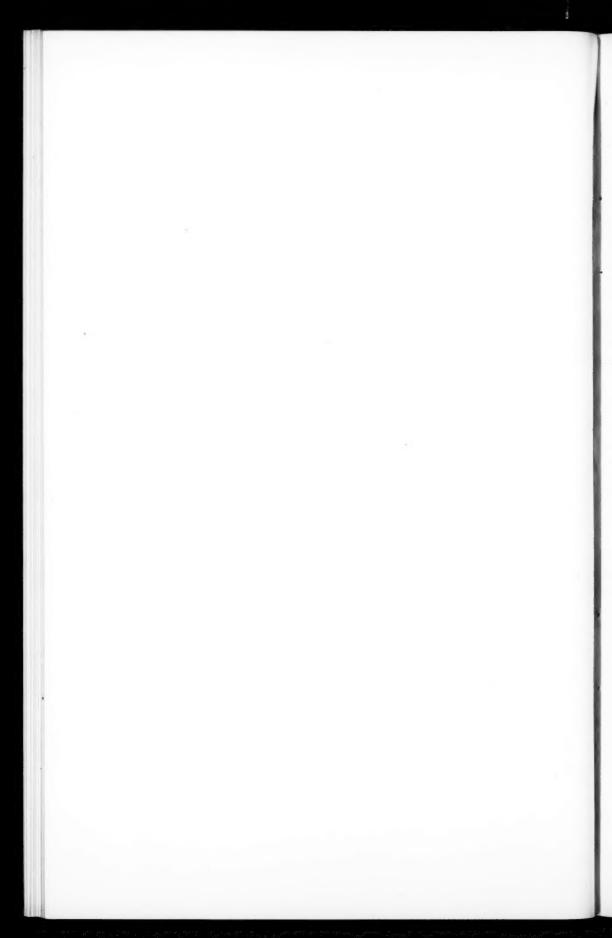
First and foremost, the calibre of the gut remains patent, and death from inanition is rendered impossible. Again, artificial anus which results will probably be small and close in a few weeks or months without operative interference. Where the gangrenous area is surrounded by healthy tissue and sufficiently small it may be excised and closed as would be a gunshot wound, or it may be united, as suggested by Lindner (12), and closed by sutures holding the contiguous parts together in horizontal fold. Of the former practice and lateral suture Barette (13) reports 24 cases with 21 recoveries. Sachs (14) reports a case similarly treated with success. When gangrene involves the entire

knuckle strangulated the appearances are sufficiently characteristic. Chocolate or dark slate colored, denuded in patches of its peritoneum and in a collapsed condition, it fails to react to mechanical or chemical irritation. The odor is fetid before perforation has taken place. Where the strangulation has been very acute, as in the last case reported, the changes in and about the hernia sac need not be very marked. After the escape of a varying amount of turbid bloody fluid from the sac, the latter appears of a bright or dusky-red minus the glistening appearance of the normal serosa. When it is of older date, one after another of the hernial coverings are involved in the inflammation. They are welded together, in turn to break down. A fecal abscess is the result. In the recent strangulation no difficulty is encountered in bringing the intestine into the wound after division of the ring. In that of four or five days, adhesions make this the most delicate part of the operation. It is here that the lesions most difficult to deal with are found, and which, with or without operation, are the most frequent death-causing factors.

The most serious and far-reaching changes in gangrenous hernia are often found in the afferent portion. They may be said to involve its calibre, its nutrition, its contents and the peritoneum singly or together. Although long recognized, the dangers inherent in this part of the intestine have recently been strongly brought forward by Beneke. Above the constriction there is always some dilatation with more or less paresis and congestion of the intestinal wall. It may be darker in color and cedematous from venous stasis. Possibly from the same cause its mucous lining secretes abnormally and as a result at times enormous accumulations of fluid are found: according to Mikulicz from one to three quarts. This forms an excellent culture medium for bacteria and in the process of putrescence toxines are formed, the absorption of which doubtless accounts for many deaths under the mask of acute sepsis from strangulated hernia before peritonitis has developed. The disintegration of this fluid gives rise to a fecal odor irrespective of the site of the constriction, and it is this fluid forced into the stomach and thence regurgitated that is so often mistaken for fecal vomit. (Mikulicz.) Furthermore the wall of a paretic and congested gut has no power to resist the pathogenic organisms which it encloses. Far above the



FIGURE 2. (See page 338.)



constriction hemorrhagic infiltrations, diphtheritic-like deposits on, or ulceration of, the mucous membrane, may ensue. This is far more liable to such necrotic changes than the outer tunics and there is no way of knowing how far the process has extended. In one of Kocher's (15) cases the gangrene extended four inches and in one of Taendler's (16) six inches above the suture line. In a case not submitted to operation the diphtheritic deposits were found six feet above the constriction.

When death follows hernia, the symptoms of peritonitis are rarely absent. In the majority of cases, even of gangrene, there is no perforation within the abdomen, and the course of the peritoneal infection must have been through the macroscopically intact gut. That it may occur where the gut does not enter into the hernia has already been seen (case 1). It has long been known through Nepveu's (17) investigations that the fluid transudate in a hernial sac is rich in pathogenic organisms before gangrene has developed. Benneke (18) has recently shown that the bacteria readily pass through the wall of the paretic bowel and produce diffuse peritoneal infection. On microscopic sections he was enabled to trace their progress through the intestinal wall. From these metastatic infection in remote organs may ensue. The process is like that seen in other morbid conditions of the intestine; notably in typhoid fever and appendicitis, where peritonitis develops without actual perforation.

Equally important with the local, is the general condition of the subject of a strangulated hernia in determining the plan of procedure. When delay has brought the patient to the verge of collapse, when even the shock from prolonged anæsthesia cannot be ventured, that must be done which most readily gives relief to the strangulation. It may be the opening of a fecal abscess, the division of the stricture, or the rapid fixation of the gut in the wound. Whatever the procedure adopted in the condition indicated, the result will probably be the same—death within a few hours or days.

In most cases, however, the condition is less deplorable and evidently tolerant of a somewhat prolonged operation. It is in this class that choice must be made between the establishment of an artificial anus and resection of the bowel with immediate suture of the divided ends.

Unfortunately authorities are not to be relied on, for they are divided. In England, Baker, MacCormac, Banks, and Treves decidedly oppose the greater operation of resection. In this country the same opinions have been held unless they have been recently influenced by the reports of successful cases of excision by McCosh (19), Richardson (20), Dawbarn (21), and others. In Germany, Kocher's and Czerny's first successes were followed by many failures which frustrated the natural desire of surgeons to make primary excision the normal procedure in gangrenous hernia. Finally Reichel's (22) critical review of the statistics in 1883 made it appear that the preferable primary operation was enterostomy to be followed by a second operation for the closure of the preternatural opening. From the very first Kocher has remained steadfast to the ideal operation, and in Mickulicz he has recently found a most able supporter.

The advantages and disadvantages of the two procedures are almost apparent. If primary resection is successful the patient is well in from four to six weeks. If an artificial anus is successfully established a second operation of a very serious nature must follow. The artificial orifice is as large as the bowel and the mucous membrane is prone to prolapse. Such an opening never closes spontaneously.

While in a considerable number of cases the enterotome of Dupuytren might be successfully applied with the low mortality of five per cent. (Korte) (23), it will fail in many cases and be absolutely inapplicable in others. Again, according to Dupuytren it should not be used for two or three months after the primary operation. It is during this interval that the very greatest danger from artificial anus is encountered, that from progressive inanition. Recently Poulsen (24) has used it twelve and even nine days after the first operation.

It has not yet been established how much of the intestinal canal is essential to the maintenance of nutrition, but where the fistula is above the milk-part of the ileum rapid emaciation and death follow before any secondary procedure for closing it can be practiced. McCosh does not overrate the argument of statistics in the statement that the death-rate of all cases in which an artificial anus is made, including the operations for its relief, is fifty per cent. The danger from secondary resection and

enterorrhaphy is very considerable. Haenel mentions forty-three cases with sixteen deaths and two failures.

To be successful the artificial anus must be established in healthy bowel, else the dangers inherent in the afferent portion will not be removed nor will a free outflow from the intestine be secured. The only advantages therefore which can be claimed for this method are the rapidity with which it can be performed and the slight technical skill required in its performance. A further advantage is supposed to exist in the lesser danger connected with this as compared with the major procedure of immediate resection.

There is hardly a subject in surgery concerning which statistics are so much at variance as are those relating to gangrenous hernia. According to Korte of III cases treated by enterostomy eleven ended fatally. Herman (quoted by Haenel) mentions 83 cases with 7 deaths. On the other hand Weil (25) reports 15 cases with 13 deaths. Benno Schmidt places the mortality at 85.5 per cent. for the formation of an artificial anus as against 71.1 per cent. for primary resection.

F. A. Southern, surgeon to the Manchester Royal Infirmary, recently reports eighty-five cases of herniotomy with nine cases of gangrene. All of the latter died. In six an artificial anus was made; in three primary excision.

If statistics are of any value in solving the relative merits of enterostomy and primary excision, it is evident that the reports of scattered cases are far less weighty than such from a few and skilled operators and from hospital records where nothing is concealed. Such a tabulation has recently been made by Mickulicz (26) from seven large clinics of Germany and Switzerland. Of one hundred and sixty-eight cases of gangrenous hernia one hundred and nine died. Of ninety-four in which an artificial anus was made seventy-two died; mortality, seventy-six per cent. Of sixty-eight primary excisions thirty-two or forty-seven onetenth per cent. died. Of six intermediary resections five died. It would appear from this that the mortality of primary excision is very much less than that of the lesser operation. But this can be accounted for by the certainty that the latter was often used as a last measure in conditions approaching collapse and therefore precluding the major operation.

The advantages of primary resection are patent. Its advantages are, in the time required for its performance and in the danger of peritonitis from imperfect technique. In a measure both can be overcome. The first of these is probably grossly exaggerated. With separation of the mesentery as indicated in the fourth case and its closure by suture to be followed by the continuous Lembert suture or by lateral anastamosis, not more than half an hour at most should be required for the enterorraphy. Complicated clamps, a separate row of stitches for mucous and serous tunics, interrupted sutures unnecessarily waste time. Where the continuous suture is used and appears weak at points a few supplementary stitches can easily be taken. Suturing the mesentery brings the intestinal ends naturally together and gives assurance that the most treacherous part of the suture, that near the mesentery, can be properly applied. The second danger is from injudicious selection of the lines for suture. As elsewhere in gangrenous processes the danger lies rather in removing too little than too much. If Kocher excised five and Koeberle six feet of intestine, a few inches more or less cannot be important. In acute cases where the calibre of the gut has not been long occluded and koproostasis is little if at all developed, an inch or two on each side of the constriction groove will probably bring the suture line in healthy tissue. Where the mesentery has not been included in the strangulation, the same favorable conditions may be expected. Where however much dilatation of the afferent gut exists, its thorough evacuation should precede the enterorraphy. After hernia, as after laparotomy for obstruction, it is fatal to return a distended gut to the abdomen. The second danger, that of septic infection of the peritoneum, can in a large measure be reduced by thorough irrigation of the sac before suturing; by careful handling of the gangrenous gut without the wound meanwhile protecting the peritoneum by gauze packing. Finally, the sutured intestine should be left just within the abdominal cavity and a radical cure should not be attempted. Mickulicz, whose success surpasses that of any other operator-21 cases with 14 recoveries-insists on the open treatment of these cases. Should fecal extravasation ensue from defective suture or other cause, it would naturally turn towards the wound whereby the danger of general peritonitis would be largely averted. For from two to five days after the operation the sutured intestine remains where it is placed within the abdomen, and after that length of time the development of peritonitis is not probable. To hasten the process of wound repair, deep and superficial sutures might be drawn through the wound margins and kept over the gauze packing, to be tightened without anæsthesia after the danger line has been passed.

Between the extreme measures considered, others looking towards a compromise have recently been brought forward by a number of surgeons. Among these are the intermediary excision and suture of Riedel (27). The artificial anus is established in the usual way. After twenty-four or forty-eight hours the edges of the intestine are vivified and united by suture. In 1882 Bouilly (28) suggested excision and suture, the latter being purposely made imperfect at one point to guide the fecal extravasation. To avert the danger from imperfect suture, Hahn (29) follows the kelotomy with a median laparotomy. Through this wound he brings the divided ends of the bowel, thoroughly protecting the abdomen against infection by packing them in gauze. When the suture is completed the closed knuckle is kept in the wound and gauze splints until union is assured. The competency of the suture is certain after 24 hours, when the bowel is returned to the abdomen and the external wound closed. It is difficult to understand why the same procedure could not be carried out in the inguinal herniotomy wound. Nevertheless Hahn has had two successes with it, and in a third, reported by Kutschera (30), the result was equally satisfactory.

To overcome the danger from death from inanition Helferich (31) has recently combined enterostomy with an intestinal anastomosis above the constriction furrows. By this method two courses are open to the intestinal circulation and the closure of the artificial anus is greatly facilitated. The operation was done in two cases, one of which was successful, the fecal fistula closing spontaneously.

There is yet another class of cases in which the condition of the bowel is such that whereas gangrene is not yet present, it might through subsequent necrosis cause death if returned to the abdomen. Such a knuckle is a menace. Who has not seen it? Especially if operating by light both artificial and bad. Bowel that is not at all doubtful in appearance will at times repay the trust placed in it by a perforation. Among 96 deaths after herniotomy, it was in 26 cases the result of returning intestine to the abdomen which subsequently perforated. In Hagedorn's clinic three deaths out of 15 resulted in the same way. return doubtful intestine is unnecessarily jeopardizing life. treat such intestine as radically as bowel already gangrenous is an extreme measure, not to be advocated. Fortunately the intestine can be retained in the wound for a number of days in gauze packing or by sutures. When its viability has been established it is an easy matter to return it to the abdomen. Graefe (32) recently reported a successful case in which the intestine was so retained for five days before replacing it. Should the dread of adhesions be feared, the intestine might be retained just within the abdomen by fixation sutures or by gauze. In the event of gangrene the fecal extravasation would course toward the external wound.

When in 1880 Czerny reported his first case of primary excision for gangrene, he believed that the operation would not displace the older operation of enterostomy. Although the last four years have brought forward success after success from primary resection, the dictum of Czerny still holds good. Each operation has its proper field. The boundary lines are becoming more clearly defined. Nevertheless it must always remain for the judgment and tact of the surgeon as individual cases arise to determine the proper procedure to be adopted. In operative surgery, as elsewhere, the ideal should be sought. This would make primary excision the normal procedure in gangrenous hernia, and only cogent reasons should cause the operator to refrain from striving for the ideal.

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MUSCULO-SPIRAL PARALYSIS, COMPLICATING FRACTURE OF THE HUMERUS.

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N 562 cases of simple fracture of the humerus treated during the past twelve years at the Chambers Street Hospital, in New York, but three cases of musculo-spiral paralysis are to be found. Bilroth, during a period of sixteen years in his clinic at Vienna, saw only three cases. Bruns was the first to accomplish the collection and classification, and his results are most interesting. He shows that while injury and compression of nerves in connection with fracture is of uncommon occurrence, still the complication is decidedly more frequent than has generally been supposed. He has collected the large number of 189 cases of nerve injuries with fractures, and all but 21 cases are simple fractures. Of the 189 cases, over two-thirds (135 cases) were connected with nerves of the upper extremity, and of these 135 cases, 77 concerned the musculo-spiral nerve alone, and 2 cases involved the ulnar and median in addition. He found that the humerus was the bone most frequently complicated with nerve lesions, and the musculo-spiral the nerve most often concerned. Thus, in 101 cases of fracture of this bone attended with paralysis, there were 73 examples involving the musculo-spiral nerve. As to the seat of fracture, the lower and middle thirds were the most dangerous for this nerve, as shown by 4 times in the upper, 25 times in the middle, and 19 times in the lower third. Certainly these results show that the complication in question is not a rare one. Primary paralysis was more than twice as frequent (62 cases) as the secondary variety (25 cases), and of the former class the great majority (44 cases) were caused by contusion of the nerve, while in the secondary variety almost all cases were due to compression by callus and cicatrical tissue. Bruns's collection of cases ends with the year 1885, and in examining the literature since that year only five cases have been found. To these I am able to add the following case:

R. S., seven years of age, on March 25, 1891, was run over by a wagon and sustained a simple fracture of the humerus about the middle third. An ambulance surgeon reduced the fracture, applied a right-angled splint, and removed the boy to a hospital. That night the boy developed measles, and on the following day was removed to another institution. Here he remained about six weeks for treatment of the measles, and the fracture apparently received but little attention. On returning home, the splint was removed and the arm was found to be crooked, with loss of power in forearm and hand. On June 10th examination revealed well-marked deformity at the middle of right arm, a bowing outward and backward; and at this point was felt a prominence, evidently the upper extremity of lower fragment. Very little evidence of callus, no pain or crepitus, and a suspicion of false point of motion. Measuring both arms from acromion to olecranon shows a shortening of an inch and a quarter of right arm. Power of extension of forearm remains, but supination of forearm, extension of wrist, and radial flexion lost, "wrist drop" marked, also impaired extension and abduction of thumb. Fingers flexed, but, on passive extension of proximal phalanges, extension of terminal phalanges is normal. Some atrophy of supinators and extensors, but they respond to faradism; sensory disturbances slight. Incision was made two inches long on outer side of arm carried down to site of fracture, as nerve was not seen; the incision was carried downward and nerve exposed in its course between brachialis anticus and supinator longus muscles. On following the nerve up from this point, it was found firmly adherent to and tightly stretched over the edge of the lower fragment, which was dislocated upward and outward. At the point of compression the nerve was smaller, completely flattened out, and of a dark-red color, which extended a short distance above and below. Incision through periosteum, chisel inserted, and the edge of fragment removed; the nerve released and held to one side. On examination of fracture, the lower fragment was seen dislocated as mentioned, rotated strongly inward, and united to the upper fragment at an angle of 150°. The arm was refractured by cutting through the callus with a chisel and straightening the member with the hands. Ends of fragments smoothed off with rongeur forceps and approximated with a strand of silkworm gut passing through holes drilled through the bone.

Periosteum united by catgut, wound disinfected and united by a few deep and superficial catgut sutures. Splints removed in six weeks. Four weeks after operation there was some power of extension of fingers, and from that time his history is of steady improvement. Eight weeks after operation there was good use of arm, but not complete restoration. Late in September he returned to hospital with a small fluctuating swelling over site of wound; incision let out a small amount of pus in which was found the silkworm gut. Wound soon healed, and he left with perfect and complete restoration of the right arm. On questioning the boy closely, he said that he was able to extend the hand and fingers immediately after the accident, and that the movements were not abolished until some time after his admission to the institution where he was treated for the measles. Four or five weeks elapsed before the fracture was examined, so it is fair to presume that the dislocation took place some time after the original application of splints. The case, therefore, is of some significance, as it is an example of compression of the nerve through secondary dislocation of a fragment, of which only few cases are on record.

The addition of the eleven cases collected in this paper to the number collected by Bruns makes ninety cases in all-certainly not a small number. Of this number, thirty-eight (fortytwo per cent.) were treated by operation, and in almost all the nerve function was restored. While in thirty-four cases neurolysis was performed, in only three cases was the nerve sutured, showing the rarity of complete division of the nerve. Of the cases treated by neurolysis, the great majority (twenty-two cases) were examples of compression due to callus or cicatricial tissue; only seven were due to compression by a dislocated fragment. It is interesting to know that a large percentage were treated by operation, and that the results were mostly successful. Where paralysis is due to compression by callus, cicatricial tissue, or dislocated fragments, already consolidated, in my opinion the earlier the nerve is liberated the sooner will the patient be cured. Some authors advocate, however, waiting for months to see whether Nature will not effect the cure. Where the paralysis is due to the contusion of the nerve, and if no improvement appears in four to five months after the injury, I think exposure of the nerve is indicated. In such cases the nerve substance may be destroyed and replaced by fibrous tissue, which can be removed and nerve suture applied, or compression by a small fragment of callus or a

fine band of cicatricial tissue may be found. A point worthy of mention in the performance of neurolysis is to expose the nerve, not at the point of compression, but rather at some distance above or below, and then follow it up to the desired spot. By so doing, one lessens the risk of injuring or cutting the nerve in our attempt to find it when enveloped in a mass of callus or cicatricial tissue. Finally, in the examination of every case of fracture of the humerus, it is wise to look for an injury of the musculo-spiral nerve before applying the splints; otherwise the injury may be overlooked and not discovered until the appliances are removed, and it will then be impossible to say whether the paralysis was due to the injury or not.

In conclusion, I would state that this paper has been prepared to show that the musculo-spiral paralysis is not so infrequent in connection with simple fracture of the humerus, and also to place on record the case which came under my care.

EDITORIAL ARTICLES.

CZERNY ON THE PRESENT STATE OF THE SURGERY OF THE
GALL-BLADDER. I

Professor Czerny, of Heidelberg, in a recent article contributes his views and experience in the surgery of the gall-bladder, based upon eighteen cases. He prefaces his paper by the remark that no surgical interference is demanded in cases in which gall-stones produce no discomfort, even though they can be felt as tumor-like swellings. Cases also in which attacks of colic disappear quickly, the co-existing jaundice is of but short duration and the symptoms can be readily relieved by internal treatment, belong to the domain of internal medicine as long as the symptoms take a mild course, are of short duration, appear only at reasonably long intervals and do not seriously interfere with the general health for a longer time. But if the phenomena connected with severe cases follow rapidly upon each other, and if, also, during the intervals a duil feeling of tension, discomfort and pain persist, it is then certainly advisable to consider whether with the aid of surgery relief cannot be secured.

The most severe cases are those in which icterus exists for months, where the fæces are entirely devoid of bile, the urine of nearly black color, the strength failing and sleep greatly disturbed by severe pruritus. If these conditions are associated with hemorrhagic diathesis, scorbutic phenomena, and if, by long continued retention of the bile, atrophy of the hepatic tissue appears so that even with entirely white stools the urine is no longer of a very dark color, if the symptoms of intoxication by absorption of the constituents of the bile step into the foreground, then it will always be too late for successful surgical interference. It will be the lesson of future experience to ascertain how far we can go with operative measures in such cases, but also, especially to prevent the occurrence of such hopeless conditions.

¹Deutsche Medicinische Wochenschrift, 1892, No. 23, p. 516.

The two varieties of cases to be distinguished are those of gall-stones without long continued icterus and those with long continued icterus. In the first variety the calculi are found in the cyst, wedge themselves into the ductus cysticus, produce, at times, collateral swellings and narrowing of the hepatic duct and cause either through these circumstances, or when they in their gliding onward pass through the ductus choledochus, temporary icterus. Often pyogenic bacteria gain entrance into the gall-bladder, causing inflammation, ulceration, retention of pus in the gall-bladder, and inflammation in the surrounding tissues. Frequently these complications do not appear; at least, one observes often pure hydrops of the gall-bladder, the retained contents of the cyst, through the long continued occlusion of the cystic duct, having been rendered clear and watery.

Cases without icterus frequently give rise to diagnostic difficulties. If careful bimanual palpation with or without anæsthesia, in the left lateral position of the body, discloses a swelling which in accordance with location and size may lead one to suspect a filled gall-bladder, then one also frequently thinks of a piece of isolated liver, an ecchinococcus cyst, floating kidney, pyloric or intestinal tumors, even of ovarian cysts in an abnormal location with fixation.

The author does not intend to consider the differential diagnosis of these different diseases, but would like to emphasize that often the employment of an exploring trocar will remove all doubts, and that he has never observed ill consequences from their use.

Should careful palpation fail to disclose any distinct swelling, then the diagnosis will be still more difficult and only if, with intervals extending often over years, again and again pain appears in the region of the gall-bladder, transitory circumscribed peritonitis occurs in the region mentioned, temporary icterus with vomiting and constipation exist, the diagnosis of gall-stones in a small, shrunken gall-bladder will be indicated. The rarely absent fever with rigors will only aid to support the diagnosis.

Although the calculi may leave the gall-bladder without prodromal icterus, by an ulcerative process and enter the colon, the peritoneal cavity or omentum, they, however, become productive of serious

symptoms only when they are lodged in the ductus choledochus and permanently prevent the passage of the bile. The gall-ducts above the valve of Vater may be distended to the calibre of a thumb, but the part which runs within the wall of the duodenum remains narrow and allows only with difficulty the passage of gall-stones of the size of a bean. Considering that a long existence of these circumstances nearly always causes adhesive inflammatory conditions in the neighborhood of the ligamentum hepato-duodenale, it will, even with an opened abdominal cavity, be difficult, sometimes even impossible, to palpate small concretions in the ductus choledochus.

The ductus cysticus is often distended by retention of fluid, the calculi in the gall-bladder may, thus, proceed and will be pushed into the upper end of the hepatic duct by the retained bile. Concretions may, also, be formed in the extensively distended branches of the hepatic duct. It has been experimentally proven, that in animals in which the gall-bladder had been extirpated, the ductus hepaticus is gradually distended, and, therefore, this consequence may also take place in man after extirpation of this organ and lead to the formation of gall-stones in the liver.

Extirpation of the gall-bladder does, therefore, not protect from renewed formation of calculi, even, if no positive observations on this subject have been published. At any rate this circumstance must urge us to save this structure as long as it is not degenerated. Another consideration is to be taken into account to cause us to be quite conservative in this operation. Since von Winiwarter has shown that the gall-bladder may be used to convey the bile into the duodenum, if the ductus choledochus is permanently closed, since this cholecystenterostomy has been very much simplified by Kappeler, it is agreeable to know that one always can make use of this resource, if the ductus choledochus should be occluded through concretions, neoplasm or cicatrices. If the gall-bladder would have been extirpated, and then an occlusion of the ductus choledochus would occur, we could only remedy this if it was practicable by either striving: 1, to feel the stone in the ductus choledochus, to crush or remove it by incision-choledochotomy, as is known, has already been performed successfully several times; or, 2, to unite the distended duct with the duodenum by means of a "labiated and hemmed" fistula. Sprengel has tried this once successfully; perhaps one could, also, dissect out that part of the duct, which is not distended, divide it where it enters the wall of the duodenum and then insert it at a new place into the intestines; or 3, to incise the duodenum in its vertical portion and through this incision sound and dilate the duct. But as even the pathological anatomist is often obliged to search a long time, before he can detect the opening of the duct in the duodenum, this procedure does not promise much.

The indications for operation in the first class of cases, without permanent icterus, are, essentially, symptomatic. Stones in the gall-bladder may cause pain for decades, may even prevent the bile from entering it, without, however, endangering directly life. The agony may, however, be so great, that morphinism may easily be induced. The desire to be cured is so sincere, that an indication for an operation is not rare.

In these cases we have to deal mostly with the gall-bladder alone, . whilst the ducts, except the cystic duct, functionate normally. It is important to investigate, after abdominal section has been done, where the calculi are lodged, and whether already changes have taken place in the gall-bladder. Although the safety in performing the operation at two sittings is unquestionable, it is better to reserve it only for those cases in which the contents of the gall-bladder are purulent. It is very difficult to investigate the state of the walls and nature of contents of a tensely-filled gall-bladder. It is better, therefore, after it has been brought to view, to evacuate its contents with an aspirator. A good method is also to protect the abdominal cavity and surrounding tissue by pads of iodoform gauze, to incise the gall-bladder and wash it out with a boracic acid solution. In an open abdominal wound one can investigate the exterior as well as interior of the gall-bladder and its ducts, and immediately finish the operation whatever method may be selected. If the operation be performed at two sittings and a fistula be established, then one can only work in the interior of the gallbladder and has to leave everything else to nature.

However, if an operation without interruption be performed, we undertake a more extensive and, therefore, more dangerous step, but in this case, also, the complicated cases may be quickly finished, and the contents of the gall-bladder are not very dangerous for the peritoneum. The one-seance-operation, also, offers us the opportunity of drainage, which has to be omitted if we perform an operation at two sittings.

Should the aspirated contents of the gall-bladder consist of pure bile, then the walls are, probably, in a quite normal condition. For these cases the ideal cholecystotomy is to be recommended. The calculi are removed by means of small spoons, hooks or thin bullet-forceps or by the use of Leroy d'Etiolles' instrument for the removal of urethral concretions; the cystic duct may be sounded by a uterine sound, and, if its lumen be free, the incision in the gall-bladder may be closed by two rows of sutures. The line of suture of the gall-bladder may also be included in the abdominal suture, in order to, thus, prevent a secondary extravasation of bile into the abdominal cavity.

If the contents of the gall-bladder be purulent, or the walls have undergone inflammatory changes, or if it is impossible to free readily the ductus cysticus, then the establishment of a temporary gall-bladder fistula is to be recommended.

If the gall-bladder has become softened through ulcerations, or if it be divided by scars and strictures into different compartments, which latter are filled with small calculi and purulent matter, then it, as a rule, has to be cleared from its adhesions to the liver, omentum, intestine or ligamentum teres. In carrying this out it often happens that the gall-bladder is much torn. In which case it must be extirpated; or if this is only partially possible, the remainder must be destroyed by the application of the thermo-cautery, after the duct has been ligated. Sometimes a little bladder can be formed from the remainder. but then, in the face of such an unclean operation, drainage would become a necessity. In carcinomatous degeneration of the gall-bladder, which is not infrequently associated with biliary calculi, extirpation is indicated, as long as the carcinomatous process is confined to this organ alone. Extirpation is most easily performed by first ligating doubly the cystic duct, then severing it, and finally, lifting the gall-bladder from its bed in the liver. On account of existing adhesions one must sometimes proceed in exactly reversed order.

Parenchymatous hepatic hemorrhage often ensues and is to be controlled by thermo-cautery or iodoform-gauze tamponade.

In the cases with long existing icterus and absolutely acholic fæces, the draining of the bile into the intestinal canal forms a vital indication, if the patient possesses enough force to insure successful reaction.

After mentioning and describing two new methods of incision in operations on the gall-bladder, one his own the other belonging to Langenbuch, the author offers the following conclusions in regard to the surgery of the gall-bladder.

- r. Gall-stones require operative interference as soon as they cause frequently repeated and long continued sickness.
- 2. Empyema of the gall-bladder always calls for an operation; hydrops of it only when it causes trouble.
- 3. The typical operation for calculi in the gall-bladder, consists of the incision, evacuation and suture of the gall-bladder; with drainage of the abdominal cavity (for a short time).
- 4. If the ductus cysticus be not pervious and the gall-bladder itself is inflamed, and its contents considerably altered, a temporary biliary fistula should be established.
- 5. Extirpation of the gall-bladder is only indicated in severe inflammatory or carcinomatous degeneration.
- 6. In occlusion of the ductus choledochus operation is indicated as long as the strength of the patient will permit. If we do not succeed in removing the obstruction (stone or kinking), then the establishment of a fistula between gall-bladder and duodenum is to be recommended.
- 8. The risk of life, will, as far as can be seen now, be less than in operations on the urinary bladder.

REPORT OF CASES AND STATISTICS.1

Case I.—Cholecystotomy.—Cure (at present). Female, æt. 46. Operation: Incision through the abdominal parietes along the external margin of the right rectus, 12 cm. long, later length of incision increased to 17 cm. The very much enlarged gall-bladder presented extremely hypertrophied walls and was covered by a portion of degenerated liver-tissue. Extensive adhesions to the other viscera. Separation of the gland; incision through its walls. This step was followed; first, by the evacuation of a thick, yellowish-brown fluid, containing ruddy matter, followed by deliverance of sixty-three calculi; curettement of the cavity of the gall-bladder. After control of the hemorrhage the incision in the wall of the gall-bladder was closed by means of catgut-sutures, an opening as large as a five-cent piece being left, to the edges of the latter the edges of the parietal peritoneum were stitched, the abdominal incision was correspondingly diminished in length by sutures; the gall-bladder fistula being secured in the Iodoform-collodium dressing. The course of the wound was perfectly normal. The patient was dismissed four weeks after the operation, with a small fistula, which only secreted a very little serum.

Case II.—Cholelithotomy in existing fistulæ.—Female, æt. 39. On entering the hospital (VII. 16, 1890), the patient presented in the right mammillary line, on a level with the umbilicus, a nodular swelling with three retracted fistulæ. The latter secreted continually a glairy mucous fluid which contained but very little pus. The sound met with numerous concretions. Operation: Incision of the fistulæ upward. The gall-bladder consisted of three compartments each containing several smaller and larger stones. Removal of the concretions; curetting of the walls of the gall-bladder; disinfection and iodoform-gauze-tamponade. Course of wound uneventful; dismissal of patient two weeks after the operation with a fistula, secreting, however, no bile.

The spontaneous external opening was here, as usually, nature's attempt at cure. After removal of the concretions and cleansing of the cavity the obstacle for the closure of the fistulæ was removed.

¹ By Dr. F. Hermann, (Beitraege zur klinisch. Chirurgie; IX. Heft 2. 1892.)

The small and cleansed fistula, which the patient had when she left the hospital, closed perfectly a week later, and she is to-day, nearly two years after the operation, in perfect health.

Case III.—Cholecystotomy in Empyema of the Gall-Bladder.—Cure.

Case IV.—Cholecystotomy in Empyema of the Gall-Bladder.— Operation performed at two different times; female, æt. 60.

An interrupted operative procedure was preferred here, because on account of the purulent state of the gall-bladder and the high age of the patient; but it offered great disadvantages.

Case V.—Cholecystotosmy with Hydrops of the Gall-Bladder; Carcinoma of the latter; Peritonitis.—Death.

Case VI.—Cholecystotomy after perforation of the Gall-Bladder and formation of a peritoneal abscess.—Death two months after the operation; female, æt. 62; suffered from biliary colic since three years. Operation: Vertical incision in the outer third of the right rectus muscle; extensive adhesions within the abdominal cavity; small tear made in the gall-bladder while attempting to separate adhesions; sixteen stones removed through this opening. Scraping out of the cavity of the gall-bladder, the edges of its incision being stitched to the parietal peritoneum; drainage.

Course of wound favorable; drainage removed after a week. The patient was dismissed after four weeks at her special desire. A few weeks later death took place at her home. The cause of death is not settled, as the report comes from a layman, according to which perforation of an abscess into the vena cava or aorta with sepsis seem to have been the cause of death.

Case VII.—Cholecystectomy; after perforation of the gall-bladder into a peritoneal cyst; cure. Female, æt. 36; five years ago had an attack of biliary colic lasting for several weeks, with pronounced icterus; passed 41 gall-stones per vias naturales. A painless period of two and a half years followed. Since then, again, many and very painful attacks; all remedies failed; morphinismus pronounced; great emaciation.

Operation.—Incision parallel to the arch of the ribs, an inch below it, and 20 cm. long. The condition within the abdomen was very unpromising—extensive adhesions, which required several ligatures en masse to control the hemorrhage caused on attempting to separate them. The gall-bladder was very much shrunken and disorganized. It was, finally, possible to isolate and extirpate it. It contained about twenty small gall-stones which could not pass through the cystic duct, as it was occluded by kinking.

Perfectly normal course of wound and convalescence; good general health; dose of morphine decreased. A year and a half after the operation the patient enjoys excellent health. No recurrence has taken place; free from morphinism.

Case VIII .- Cholecystectomy; cure.

Case IX.—Ideal cholecystotomy at one sitting; cure. Female, æt. 22; operation: Incision along the outer border of the rectus (right side) of 12 cm. length. From beneath the edge of the liver, the very tense gall-bladder bulged out suddenly; it was of the size of a goose-egg and its walls were very thin. An aqueous liquid was aspirated and a large stone extracted after incision of the gallbladder, which was followed by pure bile. The edges of the incision in the gall-bladder were united by means of six Lembert-sutures and another row of six sutures in the serous coat. Iodoform having been applied to the line of sutures, the gall-bladder was put back into the abdominal cavity. The peritoneum, the transverse fascia, and, also, the sheath of the rectus were closed by a continuous catgut-suture; the cutaneous incision was closed by a continuous silk-suture. Iodoform-gauze-collodium dressing. Within the next two days there were a rise of temperature, retching, considerable meteorism and sensitiveness of the abdomen; no flatus, dry tongue, inclination to cough. The sutures were removed, under anæsthesia, and turbid serum was let out from the abdominal cavity. Iodoform-wicking was introduced. After that uneventful course the patient was dismissed, perfectly cured, five weeks after the operation.

Case X.—Ideal cholecystotomy with partial resection of the gallbladder; cure. Female, æt. 45. Patient was dismissed three weeks after the operation. Two and a half months later, perfect health; increase in body weight. (Operation is described in detail.)

Case XI.—Combined cholecystotomy; cure. Under this title is understood "the ideal cholecystotomy with fixation (by means of sutures) of the gall-bladder to the abdominal wall." Female, æt. 36. Patient was up in the third week and was dismissed in the fourth. She returned three years after the operation (February, '92). She has been perfectly well until three months ago; had then two light attacks of colic; no other complaint, except obstinate constipation, probably due to adhesions of the colon transversum.

Case XII.—Cholecystoenterostomy, after temporary cholecystotomy, in occlusion of the chloledochus due to cancer of the pancreas; death three months after the operation from cachexia.

Operation.—Vertical incision through the right rectus muscle. The enlarged blackish-yellow liver presented and on its side the very tense gall-bladder of the size of a fist. Puncture of the latter yielded 300 ccm. of a clear watery fluid. The sound could be entered a distance of 14 cm. through this puncture, without meeting with calculi, but its further progress was arrested by some obstruction. Neither concretions nor any tumor could be detected by palpation. As obstruction of the ductus choledochus was suspected, but no cause could be found for it, a temporary biliary fistula, opening externally, was established, in place of the cholecystoenterostomy, in order to remove, if necessary, later on the obstruction in the duct through the gall-bladder. The peritoneal covering of the gall-bladder was stitched to the parietal peritoneum. A part of the abdominal incision was closed and the opening in the gall-bladder occluded by applying a Péan's clamp forceps.

Two days after the operation, when the dressing was changed for the first time, 500 ccm. of pure bile rushed forth as soon as the Pean's forceps was removed. The unknown obstruction in the ductus cysticus was, thus, removed. Pure bile was now discharged regularly, but in spite of this, the existing icterus disappeared but slowly and never ceased entirely, the urine contained, continually, more or less bile, and the fæces were entirely acholic. Therefore, the occlusion of the cystic duct seemed not to have been perfectly removed and cholecystoenterostomy was performed two months after the establishment of the fistula.

The fistula was now temporarily closed by sutures, elliptically circumcised, and the existing and cicatrized opening in the abdominal cavity elongated, above and below. The separation of the gallbladder could not be accomplished without injury to the continuity of its walls, which experienced several rents. The injured part of the wall of this organ was extirpated and the resulting circular opening was diminished, by two rows of catgut-sutures, to the size of a bean. A loop of the small intestine was then drawn out and united to the posterior wall of the gall-bladder by means of five sutures in the serosa. An incision 11/2 cm. long was then made in the small intestine, anterior and posterior sutures through the mucosa (together thirteen), and, finally, nine sutures through the serosa applied. Drainage by means of iodoform-wicking. Closure of the abdominal wound. Temporary improvement followed. However, soon afterward the patient sank rapidly, and death took place from exhaustion. Cause of death: cancer of the pancreas, gangrene of the lung and other complications. (The author gives a detailed account of the post-mortem findings.)

Case XIII.—Cholecystocolostomy, in occlusion of the ductus choledochus by a calculus; death from hemorrhage two weeks after the operation. Extensive report of case and post-mortem in the original.

Case XIV.—Cholecystoduodenostomy in occlusion of the choledochus through a pancreatic tumor; temporary cure.

Dr. Hermann considers now in extenso the material on this subject, contributed by Dawson, Terrier, Le Dentu, Sprengel, Israel, Courvoisier, Bardenheuer, Mikulicz and many others, and reviews their statistics as well as his own in regard to the mortality and success of the different operations.

ALBERT PICK.

LOVETT ON THE RELATIVE MERITS OF INTUBATION AND TRACHEOTOMY FOR DIPHTHERITIC CROUP.

The author calls attention to the exceptional opportunities presented at the Boston City Hospital for the study of diphtheritic croup. In this institution, in the period between 1864 to January, 1887, the operation of tracheotomy for croup was done in 327 cases. All of these operations, excepting thirty, were done between 1880 and 1887. On December 31, 1886, the first intubation was performed at the hospital, and from that time to January, 1891, the operation was done 392 times.

It seems perfectly fair to contrast these two groups of cases as bearing upon the merits of the two operations, because they were performed under like conditions, upon the same class of cases, and, for the most part, by the same surgeons.

It should be borne in mind that the cases included in these two groups are, for the most part, severe cases. The hospital is particularly well equipped for the care of these cases of diphtheria, and, in general, cases are sent to the hospital in preference to being operated upon at home. At the same time it is easy to see that the cases are sent to the hospital generally as a last resort, after the expectant treatment has been pursued in most cases too long, and the children who are admitted to the surgical department of the hospital are only too often in a hopeless condition. It has always been the policy of the hospital to perform the operation, even in manifestly hopeless cases, in the hope of affording relief. It cannot, therefore, be expected that the mortality percentage will be a low one when such a class of cases is taken for analysis; nor, as a rule, would the results be nearly as favorable as in private practice, where cases are likely to be seen earlier, and where mild cases would be seen. The proportion of cases developing laryngeal symptoms in the hospital is a small one, and most of the cases are admitted in a state of urgent dyspnœa.

For the most part, the conditions from 1880 to the present time have been constant. If there has been any change, it has been since February, 1888, when a new diphtheria ward was opened, which is

¹Dr. R. W. Lovett, of Boston, in the Medical News of August 27, 1892.

particularly well equipped and well ventilated, so that it would seem probable that any change in the conditions would tell in favor of the later operation of intubation. Since July, 1890, two house-officers have been detailed for exclusive duty in the contagious service, serving two months, and living in the ward. If there is any fault to be found with the results of either operation at this hospital, it is not to be ascribed to unfavorable conditions or inefficient nursing. The conditions are as favorable as possible.

Under such circumstances, of the 327 cases of tracheotomy, 232 died, and ninety-five recovered, making a recovery percentage of 29.05; ten cases died during or soon after operation, but only four of these from hemorrhage. It was manifest from a study of these cases that the tracheotomy death-rate at the hospital continued for months in closest correspondence with the mortality percentage of diphtheria in the whole city of Boston. In short, when diphtheria was most fatal in the city tracheotomy was most fatal at the hospital. It is presumable that the same conditions could be applied to intubation, although it has not been possible to analyze the cases in this regard. It must, however, be evident to anyone who sees many of these operations that it is the severity of the disease that kills in most cases rather than any influence related to the operation itself.

In the 327 cases of tracheotomy there were four in which it was difficult to remove the tube. Several months elapsed before it could be permanently taken out. All of these cases completely recovered.

In short, tracheotomy was performed 327 times, with 29.05 per cent. of recoveries; ten cases died immediately, presumably as the result of the operation, and in four cases there was difficulty in removing the tube.

The first intubation at the hospital was performed on December 31, 1886, and from that time until January 1, 1891, this operation had been done 392 times. During this time 139 tracheotomies were performed. It is manifestly unfair to consider these tracheotomies as having any bearing upon the question at all, because, in those four years the operation of intubation was adopted as a routine procedure, so that tracheotomy was reserved for the most part for the severest and most desperate of the cases, in which it seemed hopeless to do

intubation, so that these 139 operations, in which the recovery percentage was only 11½, cannot be taken into account in any way. It is not by this meant that the cases of intubation were selected, but that, naturally, tracheotomy, as the old and more tried operation, was adopted as a last resort in the severest cases. When it is noted that nineteen of these tracheotomy cases were moribund at the time of operation it can, perhaps, be better understood how desperate the majority of them were.

Of the 392 cases of intubation, 312 died, and eighty recovered, making a recovery percentage of 20.41.

Numerous accidents occurred in connection with the operation of intubation. Twenty-one times intubation was attempted, and immediate tracheotomy was necessitated by the cessation of breathing. Of these cases only two recovered. In three cases death occurred during the attempt to insert the tube. Two children died during the choking spells. In two cases the tube was drawn into a bronchus, and death of course resulted. In two the insertion of the tube was followed by convulsions. In two the introducer broke during the operation.

The operations were performed with care, and under otherwise favorable conditions, inasmuch as they were undertaken in a wellequipped hospital, so that the liability to accident should have been certainly no larger than in private practice.

In two respects, then, intubation does not compare favorably with tracheotomy in the study of these two series of cases: 1. The death-rate of intubation is 9 per cent. higher; 2. Accidents are much more common during intubation.

The author protests against the practice of intubation as a tentative measure, to be followed later by tracheotomy, if the case does badly.

The showing for this secondary tracheotomy is exceedingly bad when the figures are considered. In the City Hospital figures there were fifty-seven secondary tracheotomies, with but five recoveries. Other reported statistics give an equal mortality. The author, therefore, strongly advises primary tracheotomy, if it is to be done at all.

The author's final conclusion is that intubation is not so favorable

an operation as tracheotomy for the saving of life in severe laryngeal diphtheria. Two main reasons for this present themselves: intubation does not afford such good drainage to the trachea, and only a limited amount of nourishment can be taken by the intubated patient.

First, as to drainage. A child on whom tracheotomy has been performed expels through the tube large quantities of detritus, consisting of mucus, pus, and diphtheritic membrane. The stuff comes out, often a teaspoonful at a time, for two or three days, and the larger the amount of discharge the more favorable the outlook for recovery.

In intubation cases this does not occur. Whatever becomes of this mass of material, it is certainly not expelled from the mouth. It may be swallowed or it may be inhaled, but it is not often expectorated. The material is highly septic, and its retention in the body cannot be otherwise than harmful. This is a matter that has been largely overlooked, but which is certainly of consequence in severe diphtheria.

The limited amount of food that most cases of intubation are able to take is also a decided objection to the operation in severe diphtheria. In the tracheotomy series the children took from twenty to forty ounces of milk a day. Thirty ounces constituted a fair amount, and when a child took less than twenty-five ounces it was noted as an unfavorable symptom. In the intubation cases the diet was restricted to soft solids, which are inferior to milk in their sustaining power, and a much less quantity was generally taken than was the case in the tracheotomy series. A diet of soft-boiled eggs, milk-toast, ice-cream, and oatmeal, is not a stimulating one, nor is it one very well suited to maintain the strength throughout an intensely septic and prostrating disease. Rectal injections can, of course, be used to supplement feeding by the mouth, but only a limited amount of food can be taken in that way, and often none at all is retained. It is the severity of the disease that kills in most cases, whatever the operation, and the free stimulation possible in tracheotomy cases is often a powerful aid in withstanding the great prostration and sepsis. To give up the hourly stimulation of concentrated food and alcohol,

pushed to its utmost, is to give up a very important means of doing good in these desperate cases.

The general fatality following tracheotomy when done upon children under two years of age causes the author to except such children from his general condemnation of intubation.

L. S. PILCHER.

THE OPERATING PAVILION OF THE NEW GENERAL HOSPITAL AT HAMBURG.

In the beginning of the year 1889, the City of Hamburg began to enjoy the advantages of a newly-built and completely-equipped hospital, comprising upwards of sixty different buildings, each completely isolated from the others, all being located in a spacious park in the suburb of Eppendorf, distant less than half an hour's ride from the centre of the city. During the first year of the occupation of these buildings more than 12000 patients were treated in them, 3648 having been in the surgical wards. The surgical service consists of about 500 beds, and presents this special feature of interest, that all these beds are under the direction of one chief surgeon, Dr. Max Schede, constituting a mass of surgical material under the immediate care of one man, perhaps not exceeded in any other hospital in the world.

Various considerations had to be observed in the arrangement of the operating-rooms required for such a service. A special building was required which should be the centre of the surgical division and should simply serve as an operating pavilion and for the preparation of dressings. It was therefore located in the centre, separating the male and female divisions of the hospital, near the main building and in the middle of the surgical department. The following description of this building, from the first annual report of the hospital, cannot fail to interest all surgeons, in view of the large amount of work done in it and the high character of the results obtained.

The building has two floors, and a basement which extends under the whole house. A double and broad gently ascending inclined plane leads up from the general grade of the connecting walks to the landing opening into the main corridor for convenience in conveying the patients on carriages to the operating theatre. The building is divided through the centre by this corridor eleven feet wide.

Starting from the northwest side there are placed two operating theatres, one on either side of the corridor; the one on the right is entered through an ante-room which may be used for chloroforming the patients as well as for the surgeons' wardrobe. This theatre is now used for laparotomies. The larger room on the left is the general operating theatre. The instrument room adjoins the larger theatre, and one wall, the one nearest to the operating room, is formed by instrument cases. These are divided in the middle by a door. Opposite to this door is another opening into the bandage room beyond. Two waiting rooms, one for male, the other for female patients, and an examining room, which is also used for the preparation of sponges, are on the right side of the corridor adjoining the smaller operating room.

The theatres are both provided with an octagonal bay, constructed of iron and glass and having a sky-light above. The area of the larger is 52 sq. metres, of the smaller 36 sq. metres. The glass fronts cover about 16.6 sq. metres. These glass fronts have double windows, the inner one glazed with a translucent glass. The ceilings and walls are covered with glazed tiles and the floor is of Terrazzo (system Monier). The water runs off through drains in the floors into the sewer, triple traps being provided to prevent the entrance of gases. Both theatres are heated first through registers in the floor, together with a system of steam coils around the walls of the glass fronts, which can be operated independently of the floor system. These pipes are closed off from the room by plates of milk-glass. The floor heating produced an average temperature of 20° R. so that the wall system is rarely required. All the window-sills in the operating theatres, instrument room and ante-room are covered with plates of milk-glass.

The washing apparatus consists of double washstands, the tops and backs of which are made of this same milk-glass. They are provided with hot and cold water, and the washing of the hands is done in running water.

Two large electric lamps and twelve glow lights furnish the illumination. A large Siemen's lamp is used as reserve.

The instrument closets are made entirely of glass and iron, divided by glass partitions. The glass doors open into the operating theatre and into the instrument room.

Under these closets are two rows of iron drawers lined with glass and containing the dressings. There are also a number of other closets in the instrument room for keeping solutions and older and rarely-used instruments. (See diagrams.)

The furniture of the operating theatre consists, in addition to a number of iron frames for instrument trays, of three iron operating tables, one of which is fixed in the glass portion of the room. The other two tables are dressing tables, having movable head and foot pieces. The main operating table consists of an iron chest on four feet, 2 metres long, 0.6 metres wide, and 0.1 metre deep. The height of the table top from the floor is 96 cm. at the head and 84 cm, at the foot. A steam-heating pipe passes into the chest from below and passes up and down three times before passing out. The supply of steam in this pipe is regulated by a valve so that the temperature of the table is always under control. A double felt cover is placed on the table to avoid burning the patient. A large copper kettle supplied with warm water provides the warm cleansing solution. The glass irrigation bottles hold 20 litres and are fixed to the wall. There is a special faucet for washing the floor and walls. The theatre is ventilated by the upper windows in the glass front.

The bandage room contains two large double wooden closets with sliding doors, and a number of large registers. Bandages and dressings are delivered to the corridor and the instrument room.

The upper floor contains a large space with a cement floor for raw dressings, a room for the person in charge of the instruments, a room for the surgeon-in-chief, and an ante-room for storing the histories of the patients. The two rooms above the bandage room serve for the preparation of the dressings and are provided with a Terrazzo floor. Sublimate and iodoform gauze and moss-cushions are

prepared in one of these rooms. The sterilizer is also in one of these rooms (Rietchel-Henneberg's). The material which is prepared for dressings is kept in large glass-lined chests. A large drying-closet

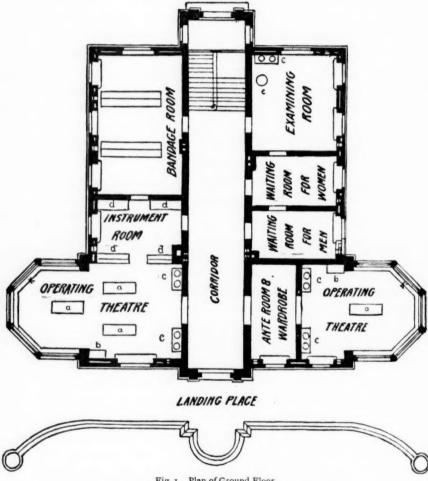


Fig. 1. Plan of Ground Floor.
e. Wash Basin for Sponges, k. Covered Heating Apparatus,
a. a. Operating Tables, b. b. Warming Boxes, c. c. Washstands, d. d. Instrument Closets.

and an apparatus for making bandages are in the second room. Washstands are in every room and all of the tables have iron frames covered with glass plates.

The basement floor has several dwelling rooms for the workmen employed in the building, and a bathroom for the assistants. There is also a closet and a heating space. The space under the small operating room is used for storing coal; the one under the larger one has a cement floor and is used for work causing dust, such as the

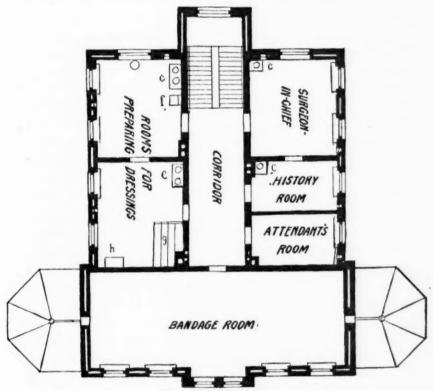


Fig. 2. Plan of First-Floor. c. c. Washstands, f. Disinfector, g. Drying Closet, h. Bandage Roller.

preparation of plaster-bandages, couch cushions, etc. The antiseptic solutions are in the corridor in large glass bottles holding 30 litres. The entire house is supplied with electricity and gas.

All bandage material is obtained in the raw state and prepared in the hospital. The material to be sterilized is first cut up, then placed in reed baskets and put in the sterilizer, through which a current of steam at 103° C. (217, F.) is passed. It is then transferred to the drying closet. Only so much of this material is prepared as is required

for each day's use. Unused material is returned to be put through the process again. The sublimate dressings are soaked in a solution made up of 500.0 of a 5 per cent. sublimate solution, 250.0 of glycerine, and 4250.0 of water. This is then wrung out and packed before it is quite dry. Moss is first sterilized, then soaked, wrung out, and made up into cushions of various sizes. Iodoform gauze and lint is prepared by soaking in a solution made of 30 gm. of iodoform, 250 gm. of glycerine, and 750 gm. of alcohol. This quantity suffices for about seven pieces of iodoform gauze each 6 m. long and 14 cm. wide.

The instruments used daily are sterilized every morning in steam. Catgut is almost exclusively employed for sewing material, silk and silver wire only being used upon special occasions. The catgut is prepared by knotting and winding the raw catgut on wine bottles and putting them into a one per-cent. sublimate solution for from twelve to twenty-four hours, according to the thickness of the gut. It is then washed with alcohol and rolled on perforated glass bobbins. It is kept in a 2.5 per cent. salicylic spirit solution. Some catgut is also kept in an iodoform-ether solution.

The needles are always kept in lime water and are always free from rust when they are put in this solution dry and not moistened with sublimate or carbolic solutions. Only sterilized dry sheets are used as coverings for patients during operations. All sheets, towels and linen aprons are sterilized, if previously used, before a laparotomy.

A woven cotton tricot is used to draw over limbs to which plaster bandages are to be applied, and has proven more pleasant and simpler than the woolen bandages formerly employed. All removable plaster dressings are likewise trimmed with the tricot.

Hard rubber is used instead of wood for splints. It is very durable and can be bent into any shape in hot water, and can be rendered absolutely aseptic. The strong and weak Rotter solutions, together with a 0.2 per cent. salicylic solution, are employed for irrigation and have proven very satisfactory. No eczema or irritation of the wounds have followed their use. All antiseptic solutions are prepared from distilled water.

SAMUEL LLOYD.

INDEX OF SURGICAL PROGRESS.

GENERAL SURGERY.

- I. Considerations pertaining to the use of Elastic Constriction as a Hæmostatic Measure. By Dr. N. Senn (Chicago).
- r. The use of the elastic bandage to secure a bloodless condition of a limb should be discarded, as compression of the parts affected may produce mechanically dissemination of malignant tumors and microbic diseases.
- 2. A bloodless condition should be secured by elevation of the limb prior to constriction.
- 3. Constriction should be made with sufficient force to interrupt at once both the arterial and venous circulation.
- 4. Prevent venous stasis by constricting quickly, beginning pressure on the side of the limb supplied with the principal blood vessels.
- 5. Linear or too firm constriction should be avoided, as they are liable to give rise to muscular injury and temporary or permanent paralysis due to harmful compression of a large nerve-trunk.
- 6. Elastic constriction of a limb for hæmostatic purposes should be diffused over an annular space not less than two inches in width, and can be made with least danger of injuring important structures by an elastic band made for this purpose or an ordinary elastic bandage.
- 7. Circular constriction of a limb should be made, if possible, at a point where the large nerve-trunks are well protected by overlying muscles, and if this cannot be done on account of the site of operation, a thick compress of gauze should be interposed between the constrictor and the limb,
- 8. The vitality of the tissues when excluded from the circulation is endangered by prolonging the ischæmic condition for three or four

hours, and gangrene may take place if constriction is continued for a longer time.

- 9. The process of karyokinesis in tissues temporarily deprived of circulation by elastic constriction is unfavorably affected if constriction is continued for more than two hours.—Internat. Med. Mag., Aug., 1892.
- II. Anaesthetic Properties of Cocaine. By A. Bignon. Cocaine in acid solution is very little or not at all anæsthetic. The usual solutions of hydrochlorate of cocaine containing ordinarily free acid, they must be neutralized; by adding carbonate of soda in excess to such a solution, the alkaloid will separate and form in the alkaline fluid a solution which (according to the author's experience) is highly anæsthetic, but must always be kept fresh.—Centralbl. f. Chir., No. 27, July 9.

SAMUEL LLOYD (New York).

HEAD AND NECK.

I. Two cases of Extirpation of Extensive Brain Tumors. By V. Bramann (Halle). The writer reports two successful cases where extirpation of cerebral tumors was performed, the patients being handed over to him by Prof. Hitzig, of the same city.

The first case was that of a man 46 years of age, who had observed, above three months before the operation, a weakness of the fingers of the left hand, which a few days later was associated with distortion of the left side of the face. To these symptoms were soon added a spasmodic contraction of the left hand and arm as well as of the left side of the face, which finally left him with a nearly complete paralysis of the left arm and the same side of the face. At the height of the spasm the head and eyes would rotate to the left side. During the following weeks the attacks would become more frequent, including the left leg, which up to that time had remained intact, and left it paretic to such an extent that the patient was no longer able to walk. In three months optic neuritis was to be discerned, though no actual "choked disc" was present. The affection was diagnosticated as a rapidly progressing, circumscribed, intracranial process, which had

its seat in the motor region, or more exactly, in the third frontal convolution as well as in the upper portion of the central sulcus. It therefore was of quite an extent. After determination of the course of the central sulcus, by means of Muller's method, a linguiform flap, consisting of the soft parts and periosteum and 7 cm. in length and 6 cm. in breadth, is so incised that the base lies a finger's breadth from the sagittal suture while the extremity is situated over the squamous portion of the temporal bone. The longitudinal diameter of the flap running quite parallel with the frontal suture. The periosteum was then scraped back for one-half centimetre from the wound and the bone chiseled through up to the margin of the base of the flap, the bone here being fractured by the slipping through of a raspatory under the edges of the wound. The large flap was then thrown over towards the median line.

The dura appeared unaltered at the posterior two-thirds of the defect, the brain pulsated all over the wound and the brain substance appeared normal. Immediately behind the anterior border of the wound the dura appeared of a bluish color, somewhat bulged up and palpation gave a revealed and tenser resistance than the remaining portions of the accessible brain. As this alteration seemingly was continued under the anterior portion of the wound, a second, almost square, flap was made, consisting of the scalp, periosteum and soft parts, with a basis of five centimetres, and lying over the tuber frontale, the flap being laid back anteriorly. This exposed the entire focus, which consisted of a bluish discoloration of the size of a half dollar, translucent and somewhat protuberant. In consistence it was tensely elastic, fluctuating, and in making an incision through the dura membranes, from the direction of the sagittal suture, a cyst was exposed, from which about an ounce and three-quarters of clear, somewhat greenish-yellow fluid was evacuated. The cyst was of the size of a hen's egg, and its walls consisted of a smooth, quite resistant membrane. In no place were excrescences or any growth to be discovered, which might lead one to think that a degenerated tumor was in question. The dura was removed in the entire extent of the discoloration and as well as that portion of the brain bordering on the cyst and a drainage tube, wrapped with iodoform gauze, was introduced into the cavity of the cyst, which had already during the operation decreased in size. The two flaps were replaced, after leaving a defect in the posterior portion for the extraction of the drainage tube and the tampon. The further course of the case was very satisfactory. The paralytic symptoms became less and less, and the general condition of the patient greatly improved. But after six weeks the same spasms and epileptic attacks appeared, but with still greater intensity, while there appeared at the still open drainage opening a greenish tumor mass, much resembling the brain in the region of apoplectic foci, only being somewhat more resistant. On microscopic examination it revealed itself to be a small round celled sarcoma. At the second operation the tumor was removed together with the adjacent skin and the anterior bony flap into which the tumor had grown.

The following improvement was, however, of short duration, for, already at the beginning of March the writer was obliged to remove the section of bone which was incised at the first operation, as a resistant mass pushed the overlying skin up more and more. The tumor and adjacent portion of the brain weighed about five and a half ounces. The defect in the soft parts remaining after the third operation was covered with a skin flap taken from the vicinity, while the resultant spot was filled in by transplantation grafting. The further course of the case was favorable, and now, three months after the operation, the patient has had no epileptic attacks, the paralysis of the leg has greatly decreased as well as that of the arm. The facial paresis is less. There is no difference in the pupils and the fundi of the eyes are normal.

The second patient was operated on May 2d, and was a painter 29 years of age, in whom about a year before the first symptoms of a brain tumor had made their appearance, as headache, vertigo, disturbances of vision. In the course of a few months paresis of the facial nerve and the left arm set in, in varying intensity. Immediately before the operation the patient presented the following complex of symptoms: left-sided paralysis of the facial nerve, the right pupil broader than the left, double choked disc, more developed on the right side, while on the right side the vision was almost gone. The left arm was paretic and the left leg weak. The soft parts over the right frontal squamous

portion of the right frontal bone were cedematous, and, on pressure, He held his head forward and to the left. His memory was weak and he was inclined to dirty jokes. A tumor of the frontal lobe was diagnosticated, it extending toward the motor region, and to all appearances was of great extent. The extending ramus of the fossasylvii was thought to be the point of departure of the growth, and after determination by means of Muller's method, a flap 8 cm. long and 7 cm. broad was incised, the base of which lay over the forehead. This being thrown back a tumor, covered by the bluishly discolored dura, came into view. It was pulsatile and of greater resistance than the surrounding brain substance. In spite of the size of the flap the tumor's posterior border lay only exposed and this necessitated the formation of a second flap, consisting like the first, of the bone and soft parts, with its basis lying near the sagittal suture. It was thrown over towards the median line and those portions of the growth which were still covered by the skull were so far removed by the chisel and Luer's forceps that the entire tumor was finally exposed. The tumor was sharply defined, the portions of the cranium covering it were either very thin or greatly thickened and bluishly discolored. The dura over the centre of the growth was foughened and apparently penetrated by the underlying mass. It was cut through at two centimetres from the borders of the growth, the very numerous arachnoidal and pial vessels being ligatured and the brain substance incised at a short distance from the tumor when it was easily removed without the aid of the knife. On account of the described appearance of the bony coverings they were also removed, for it had also grown into them. The tumor extirpated had a weight of nine ounces, and is the largest of all tumors which have been extirpated from the closed cranium. The patient stood the operation well and after five weeks the wound had nearly entirely healed. The œdema which is to be feared after extirpation of such large brain tumors was avoided quite entirely by means of tamponading, and it only became to any extent manifest when the dressing was changed on the fifth day, and then but to a slight degree, probably due to loose tamponading with the iodoform gauze. The paresis of the left leg still persists as well as a slight weakness of the left leg. The paralysis of the facial nerve has nearly

wholly disappeared. The former double choked disc is now retrogressing, the vessels still being somewhat serpentine in course. general condition of the patient, his sleep and appetite are good, while his intelligence is much improved. The writer concluded with a few general remarks showing that extensive growth is no longer an absolute contra-indication to operation and that the œdema of the brain which mostly endangers the lives of patients after operation, may be avoided by well tamponading. A conditio sine qua non for the operation is that the tumor can be sharply defined. If this cannot be fulfilled then the operation must not be attempted. An operation is justifiable when the seat of the growth is determined and there still is doubt of the size and histological composition of the tumor. As long as neurologists are willing to bear the responsibility of answering these questions the surgeon is justified and obliged to open the skull freely in the region of the diagnosticated seat of the tumor. The writer points out the varying relations of the choked disc according to the seat of the compressing tumor.

In the discussion which followed, Seydel, of Munich, gave in short, an extract out of an extensive work which he had just concluded on cerebral tumors. The well-known conclusions of Starr and Hale White led him to examine all the cases of brain tumor which had come under the notice of the Pathological Institute at Munich during the last fourteen years with regard to their operability. In order, like Hale White, to find one hundred cases of brain tumor he was obliged to examine 8,488 reports of post-mortems. In Munich there was one brain tumor to every eighty-five post-mortems, while Hale White found the relation to be as one to fifty-nine. From this one might conclude that brain tumors are less frequent among the Bavarians, but the difference lies in that in Munich fewer children come to post-mortem examination than in Guy's Hospital, hence tuberculosis of the brain is the less frequently observed. Amongst one hundred tumors, twentyseven were tuberculous, thirty-nine sarcomata, gliosarcomata and gliomata, two cysticerci, one actinomycotic tumor, three cholesteatomata, two cysts, two carcinomata, two sammommata, six syphilitic growths and sixteen which were not more closely described. V. Bergmann, in his well-known work, "Die Chirurgische Behandlung der Gehirnkrank-

heiten," sets forth that a tumor of the brain, in order to be operable, must not be too large, not of metastatic origin, not multiple location in the brain, encapsuled and be quite on the surface of the organ. Amongst the twenty-seven cases of tuberculosis, according to these indications, six would have been operable, yet if one take into consideration the condition of the other organs, then in three of these the other organs were found to be to a great degree tuberculous. Of the remaining three cases two presented the tumor superficially in the occipital lobe, one in the cerebellum, hence in cerebral tuberculosis one would obtain an operability of eleven per cent, a much more favorable result than Starr with his six per cent,, and Hale White with his seven per cent. But if one compare the clinical picture with the pathological findings one discovers that these presented no symptoms which would lead one to suspect a brain tumor and being merely accidental findings of the necropsy. Therefore not one of the cases would have been operable. Of the thirty-nine sarcomata, gliosarcomata and gliomata only two fulfilled the indications. Comparison with histories of the cases in the case-books of V. Ziemssen and Professor Bauer revealed that they had been diagnosticated accurately, and, indeed, long before death, so that the size of the tumor was not against the operative procedure. The cases of cystocercus and actinomycosis were of central situation and hence not to be interfered with. As to the two cases of cysts, one was multiple and the second of such an extent that it extended over a whole hemisphere. One of the psammomata was situated centrally and the other was an accidental find in a seventy-seven-year-old man. The cholesteatomata were inoperable. Amongst the sixteen tumors which are not nearer defined there was one which was after all appearances operable. It had been diagnosticated correctly as to its presence and seat. Therefore out of the one hundred tumors there were three which might have been operated on with success. Hale White found nine which were operable. Starr out of 3000, sixteen. As is known V. Bergmann regards seven of White's cases as doubtful, so that the operability of these cases is reduced to two. If one does not consider the cases of tuberculosis, as Prof. Kroenlein did in his work, "Ueber den heutigen stand der Hirnchirurgie," then the operability drops to two per cent. We

have at present at our disposal 500 cases of brain tumors, as statistics gathered from post-mortems, of which eleven, *i. e.*, more than two per cent. were operable, and this rate corresponds with our every-day experience.

Czerny, of Heidelberg, was of the opinion that pathologicoanatomical results were not authoritative as the following experience teaches: A man forty years of age, had suffered for ten years from headache, weakness of the right upper extremity, later epileptiform attacks and dragging of the right leg. A brain tumor was diagnosticated and with permission of Erb, who had treated the patient before, the cranium was opened on the left side to the extent of nine centimetres. A bluish red tumor of the cortex, diffuse gliosarcoma, was found which he tried to remove without seeking to define its boundaries. In spite of that the result was good, the spasms disappeared and the man returned to his work. But the improvement did not continue long, for in November, 1891, a second operation required ten to eleven centimetres of the cortex to be removed. A cyst had formed in the diseased brain tissue, with clear contents. There remained a weakness of the right hand. In brain affections in consequence of traumatism, Czerny has three times performed plastic operations. In two of these cases melancholic conditions had set in. In the first case a thickening of the skull and atrophy of the cortex had taken place. An operation produced a remarkable improvement but a relapse occurred later. The second case was operated on too recently to draw any conclusions from. The speaker thinks that after such operative procedurés the nutritive and pressure relations are so changed that the temporary improvement follows. One may compare these operations with the iridectomy in glaucomatous patients where the curative results are obtained through the altered states of pressure. -Verhandl. der Deutschen Gesellschaft fuer Chirurgie, XXI Kongress, 1892.

II. Resection of the Trigeminus within the Cranial Cavity. By Dr. F. Krause (Altona, Germany). The writer records the case of a forty-seven year-old woman who had been oper-

ated on by Volkmann for a violent neuralgia; and the second branch of the trigeminus, in its entire extent, from its entrance into the orbit as far as its single ramifications, resected. The disease soon recurred and the writer found it necessary to resect the nerve in the sphenomaxillary fossa, immediately in front of the foramen rotundum. A third recurrence was not long in appearing. For five months all the various remedial measures were tried, without success, and, as even very large doses of morphine were inefficacious, the writer yielded to the entreaties of the woman, who was undergoing terrible suffering, and determined to try another operation and find and resect the nerve within the cranial cavity. A flap, including the skin, muscle, periosteum and bone was excised in the region of the temporal muscle, with its base below, according to the Wolff-Wagner method. The incision began immediately over the zygoma, in front of the tragus, running convexly upwards and backwards, then describing a semicircular curve and descending convexly to the zygoma again. The basis of the flap, thus formed, was 31/4 cm. in breadth, its heighth 61/2 cm. and its greatest breadth above, being 51/4 cm. The base of the flap was placed below in order that the entire temporal muscle be spared nearly entirely, that the nutrition of the resultant flap be sufficient and that the bone here was so thin that, on chiseling out the bony flap the base could be easily broken, it being so thin in this place. The opening in the cranium must be large enough that, on pressing in between the dura mater and the base of the skull there will be sufficient space for the brain to elude the consequent pressure. The incision passes through all the layers of tissue down to the bone, the periosteum pushed slightly aside and the skull carefully chiseled out in the entire extent of the line of incision, with due regard for the protection of the dura mater. The bony flap is then carefully broken in its lower portion by means of an elevator and the flap turned over so that the dura mater of the entire lobe is exposed to view. The flap may be further brought down by loosening the periosteum below, together with the temporal muscle and the skin, so that it lies on the patient's cheek. The middle cranial cavity is thus exposed and one pushes his way carefully in by means of the finger and the dull raspatory, separating the dura mater from the underlying bone. At

first one arrives at the foramen spinosum and the branch of the middle meningeal artery, which here penetrates the dura mater. As in the writer's case the second branch of the trigeminus was in question he went on, without injuring the meningeal artery, until he had reached the foramen rotundum. The brain, inclosed in the dura mater, was pushed upwards toward the vault of the skull by means of a spatula, three centimetres in breadth, and bent at a right angle. If one would expose the third branch of the trigeminus or the Gasserian ganglion, then one must doubly ligature the trunk of the middle meningeal artery and sever it between the two ligatures. The third branch is more easily reached than the second branch. The hemorrhage following the separation of the dura mater is very troublesome, if one will resect the nerve at such a depth. As soon as the second branch was exposed the writer interrupted the operation, stuffed the entire cavity with iodoform gauze and applied a dressing. After five days he removed this under chloroform, together with the gauze, pressed the brain upwards with a spatula, seized the second branch of the trigeminus with a sharp strabismus knife and dissected it out of the foramen rotundum to the extent of half a centimetre. The ends of the nerve were enlarged and redder than normal. In order to favor the exit of oozing blood a strip of iodoform gauze was introduced into the wound between the base of the skull and the dura mater, allowing it to issue through a small defect in the bone posteriorly. The flap was replaced in its old proper place. The wound healed without any disturbance. The neuralgic pains have disappeared since the operation, Feb. 1802, the patient only experiencing a slight drawing in the cicatrix when the weather changes. The scar is quite smooth and the bone firmly healed into its place. This grave operative interference is only permissible, according to the writer, under two circumstances, viz., all the other measures must have been tried, together with the less severe operative procedures, and again, the gravity of the symptoms and the lack of success of all applied remedies and operations must justify the grave operation. Both these two were present in this case. Verhandl. der Deutschen Gesellschaft fuer Chirurgie, XXI Kongress, 1892.

FRANK H. PRITCHARD (Norwalk, Ohio).

III. Serous Cysts in the Cerebellum. By Dr. R. T. WILLIAMSON (Manchester). Cystic degeneration is much more frequent in cerebellar tumors than in tumors in other parts of the brain. Hence, in a given number of cases, presenting during life symptoms of cerebellar tumor, the lesion in a considerable number though, of course, in a minority—will be of a cystic nature; either a cystic tumor or a cyst in the walls of which only a small fragment of tumor or no new growth whatever is present. Hitherto operations for the removal of cerebellar tumors have been extremely unsuccessful, It is worth considering, however, whether it might not be justifiable in some cases presenting symptoms of cerebellar tumor to trephine the skull, and puncture the cerebellum with a fine hypodermic needle, in the hope that the lesion is one of the cystic conditions just mentioned; and if fluid were obtained to drain and treat as an abscess. This, of course, could only be thought of-after the failure of medical treatment-in cases the history and symptoms of which rendered a tubercular or syphilitic tumor improbable, preferably in cases in which there was some indication of the side affected. It would only be in the cases of cyst, cystic glioma, and glio-sarcoma (cystic-sarcoma?) that there would be any probability of success. But as trephining and puncture with a fine hypodermatic exploring needle (under strict antiseptic precautions) would not be a very formidable procedure, and as the cases are otherwise hopeless, it does not seem very objectionable. In the majority of cases the growth would be solid; but with strict antisepsis probably no grave results would follow. In a minority of cases, however, the lesion would be cystic; and this procedure in these cases might be followed by good results. The prospects of success are slight, but as otherwise the cases are hopeless this method seems worthy of attention .- Am. Journ. Med. Sciences, August, 1892.

IV. A Case of Cerebellar Abscess Successfully Treated by Operation. By H. P. Dean (London). A girl fourteen years of age who had been operated upon for suppurative otitis media developed a few days later symptoms of cerebral compression, and abscess being suspected a semicircular flap of skin just above and behind the

ear was turned down and a periosteal flap reflected. The pin of the trephine was placed one inch behind and half an inch above the centre of the external auditory meatus and a disc of bone three-fourths inch in diameter was removed.

The lateral sinus was exposed in the lower part and the brain protruded markedly. A small hydrocele trocar was inserted six times in different directions into the temporo-sphenoidal lobe, but no pus escaped. The second tapping struck the lateral ventricle and withdrew a few drachms of clear cerebro-spinal fluid but did not relieve the tension of the brain. As the lateral sinus seemed to bulge more than usual the trocar was thrust into it and gave exit to blood. It was then decided to explore the right lobe of the cerebellum, and the bone was chipped away backwards and downwards for half an inch so as to expose the whole diameter of the lateral sinus and the dura mater below it. The latter was then incised and the trocar thrust in. At the second insertion pus flowed freely away; a large trocar was then inserted and finally a pair of sinus forceps. Over an ounce of pus escaped; an india-rubber drainage-tube was inserted into the abscess cavity; the dura was carefully laid over the surface of the brain, but not stitched and operation completed as usual. The patient's condition rapidly improved and she became finally perfectly well.-London Lancet, July 20th, 1892.

V. Fractures of the Skull Observed in the Hamburg General Hospital during the past ten years. By Dr. C. Sick (Hamburg). Simple fissures of the skull are scraped with a sharp spoon, the contused soft parts being removed with scissors. The margins of the bone are removed with a chisel and all hair, etc., are removed. Firm bone is not interfered with unless it is pressed beneath the internal plate. In case it is depressed below the internal plate the projecting bone is chiseled off and the depressed portion elevated, to avoid future danger of epilepsy. In comminuted and punctured fractures the projecting margins are removed as carefully as possible; fragments attached to the periosteum are elevated and preserved unless lesions of the dura and of the brain require their removal. The wounds are carefully drained, sutured or packed with iodoform gauze.

Recently in cases apparently free from infection the wound has been treated without drainage; a gap being left at the lowest margin of the wound in the suture line.

As far as possible bone fragments were utilized in the same way as the buttons removed by the trephine in filling up large bony defects. In case of injury to the dura and to the brain a drain or iodoform gauze tampon is always employed. Healing under a single dressing is desirable.

Complicated injuries unless serious injury to the dura and brain are present give a favorable prognosis. When the brain is injured part of it is inaccessible to surgical treatment and antiseptic measures are useless in the soft brain substance.

This is especially true when the case comes under treatment some time after the injury, when it is almost certain to be infected. Such wounds must be treated in the same way as infected wounds elsewhere; they must be freely opened, disinfected, drained, and packed with iodoform gauze.

The treatment of the general condition is important; particularly rest, ice, attention to bowels and bladder, and perhaps alimentation by stomach tube.

In addition to four cases of bullet wound there were thirty-six cases of injury to the skull, twenty-seven fractures; four cases of fracture with injury of the dura, the brain not being involved.

In five cases a destruction of brain substance complicated the case. Thirty-three patients were cured; three died; two of purulent meningitis and one of a severe injury of both brain and skull. Jahrbücher der Hamburgischen Staats-Krankenanstalten.

SAMUEL LLOYD (New York).

VI. Empyema of the Antrum of Highmore. By Dr. W. AF SCHULTEN (Helsingfors, Finland). The writer reports six cases of empyema of the antrum of Highmore which were under his care. The most characteristic symptom he has found to be a discharge of pus from one nostril. Rhinoscopic examination revealed pus in and flowing from the middle turbinated bone nasal space. Sometimes the patients complained of pain in the forehead and swelling and pain in

the cheek. If the patient hold the head to the side or incline it forwards, the purulent discharge is increased. The chief cause of the affection the author has found to be dental periostitis. In order to treat the disease successfully the antrum must be opened through an alveolus of a molar tooth, or, in more severe cases trepanation of the upper jaw may be done in the canine fossa. In any case the opening should be made large enough that the interior of the sinus may be palpated.—Finska Laekeresaellskapets Handlingar, bd. 32, s. 373.

FRANK H. PRITCHARD (Norwalk, Ohio).

VII. Preventive Tracheotomy with Tamponade of the Pharynx in Operations Affecting the Mouth and Pharyngeal

Cavities. By V. Civil. The author describes the horrors of a great operation in the region of the cavities of mouth, nose and throat, augmented by the half narcosis employed by many surgeons, and the new dangers to the patient after operation, the most serious of which is septic pneumonia.

Tamponade of the air-passages with previous tracheotomy has been introduced to obviate the numerous difficulties, and has been very successful in Germany, America and England.

The author objects to Trendelenberg's canula, because it is apt to spoil the caoutchouc-balloon, and the patients cannot bear it. Michael and Hahn's modifications are likewise objectionable, since they act, after a while, like tamponading filters.

Civil does, of course, not favor Verneuil-Krishaber's method of laryngeal tubing, nor MacEwen's introduction of a wide rubber tube (of course, without tracheotomy), nor tamponading the larynx from the tracheal wound. Kocher's method of preliminary tracheotomy with subsequent tamponade of the throat appears to the author to accomplish the desired end. The easy change of the tampon after operation and the fact that the patient can bear it for some time, are very great advantages.

The general advantages of this method are, according to C., the convenience of narcosis, the control of hemorrhage and the prevention of infection. Having discussed the indications for preliminary tracheotomy and tamponade of the upper air-passages in the different

operations on tongue, throat, palate and jaws, he concludes that the tamponade of the throat, according to Kocher's method, is, in reality, nothing else but the application of Lister's principles to the surgery of the mouth and throat.—Centralb. f. Chir., July 9, 1892.

VIII. Results of Tracheotomy for Diphtheritic Croup.

By DR MAYER. 316 tracheotomies have been performed at Furth since 1874, on 166 boys and 139 girls. 103 cases were cured, the percentage of those operated on between the ages of three and thirteen years being between twenty-nine and fifty. Tracheotomy was resorted to in every case of danger by suffocation. Intubation is only indicated for cases where there is difficulty in removing the canula.— Centralbl. f. Chir., July 9.

IX. Results of Tracheotomy. By Dr. Bajardi. Of 115 tracheotomies, 63 were performed on account of croup, 52 for croup complicated with diphtheria of the throat and nasal cavities. Forty-two per cent. of croup and 34 per cent. of diphtheria were cured. Death occurred five times during operation, three of the cases being children already asphyxiated. Most of the children were chloroformed. Crico-tracheotomy was performed 55 times, high tracheotomy 46 times and low 14 times. Emphysema colli was observed once, after operation, arterial bleeding once, diffuse phlegmon of neck some times and necrosis of the tracheal wound-edges often. The removal of the canula was retarded three times owing to granulations.—Centralbl. f. Chir., July 9.

SAMUEL LLOYD (New York).

CHEST AND ABDOMEN.

I. Method of Total Resection of the First Rib. By A. Cec. This method may be applied equally to the right and to the left sides, although the anatomy of the nerves and vessels is not identical. Two purposes guide him in his operation: 1. To obtain a wide opening for completely controlling the first rib by parting the clavicle and temporarily bending it apart. 2. To take hold of the

first rib at both ends, after having rendered it accessible and isolate it from the important organs around it, so that it can be extracted without injuring any of them. The method consists of (a) the external incision; (b) the separation of the clavicle; (c) the formation of a musculo-cutaneous flap; (d) the isolation and extraction of the first rib; (e) the reposition of the flap and the union of the clavicular fragments; (f) the suture of the skin flap. Ceci regards the primary new formations (osteochondroma, sarcoma, etc.) and tuberculosis of the bone as indications for the operation.—Centralbl. f. Chir., July 9.

II. Concerning the Technique of Empyema Operations and Diagnostic Punctures. By O. ROSENBACH. It is sufficient, in fresh cases of empyema, to make a simple incision and to introduce two strong drainage tubes. A rib-resection is, the author states, necessary only in old cases, when an ample resection is required to close the rigid cavity.

Pus will pass into the cylinder of the syringe in exploratory puncture only when it is so liquid that it can easily pass the fine canula after overcoming the resistance of friction. If the pus is a thick fluid or mingled with flakes, the point of the canula may be in the abscess-cavity, without any of the pus being drawn into the cylinder of the syringe. If, therefore, the result of exploratory puncture be apparently negative, the exhaustive force of the syringe must be maintained and the canula drawn out. By doing this, a small drop of thick pus, especially a flake, remains fixed in the initial portion of the canula; and would indicate the presence of pus.

The presence of the smallest drop of pus in the point of the canula is proven by holding an object-glass to the point and then slowly pressing down the piston. An exploratory puncture is negative only when this manipulation does not prove the presence of pus.—Centralb. f. Chir., July 9, 1892.

SAMUEL LLOYD (New York).

III. Empyema after Influenza. By K. E. LINDEN (Helsingfors, Finland). The author has observed six cases of purulent inflammation of the pleural sac in one hundred and thirty-six cases of

influenza. They either made their appearance immediately following the disease or a few weeks after its disappearance. In none of the cases had a pneumonia preceded. Pleurotomy, with resection of a rib, was done in all the cases and in all was followed by recovery. The average time of duration of the affection was forty-seven days. The thin and sero-purulent exudate contributed greatly to the good results, and the rapid recovery.—Finska Laekeresaellskapets Handlingar, bd. 32, s. 395.

FRANK H. PRITCHARD (Norwalk, Ohio).

IV. A case of Lesion of the Gall-ducts. By Dr. Kernes. A technologist, 25 years old, injured on November 2, the pole of a carriage striking him on the right side and pushing his left side against a wall. Though feeling violent pains on the right side, he felt able to go home, but had to lie down at once. He had pains in the right side and shoulder, nausea and constipation. There was considerable swelling, which diminished somewhat, as did the pain under water compresses. Diarrhoea succeeded the constipation. Discoloration of the stools was not observed; no blood; no blood in urine. The condition of the patient gradually grew worse without any perceptible cause; swelling increased; breathing difficult; jaundice.

Temperature 37.6 to 38. Pulse frequent with tolerably good tension. Appetite poor, tongue coated; urine brown; free from albumen and sugar; containing biliary coloring matter. Abdomen uniformly distended. Percussion tympanitic, dull in dependent parts. Fluctuation present. Respiration frequent and superficial. Liver and heart displaced upward.

In consequence of the increasing dyspnæa and change for the worse in the pulse and general condition, puncture was resorted to, and two litres of a brown fluid was evacuated containing albumen and large quantities of biliary coloring matter.

In one day he was just as much distended as before. Laparotomy was therefore resorted to. There were removed from the abdominal cavity about three litres of brownish fluid, and an enormous quantity of large blood clots. In the region close below the liver, pure brown

gall bubbled forth at slight pressure. Intestinal peritoneum was injected, velvet-like, with delicate and fibrous accumulations here and there Many agglutinations of intestinal loops with one another and with the border of the liver corresponding to the gall-bladder; the lower surface of the liver can, therefore, not be accurately palpated. The right lobe of the liver reaches far down; a furrow is felt at the lower surface. The peritoneal cavity was wiped with sterile gauze compresses and the abominal wound closed with silk-sutures.

After the operation the belly was swollen, with marked meteorism; vomiting and constipation. General condition very weak. Pulse small and frequent, often necessitating injections of camphor-ether. An improvement took place only on the third to fourth day.

First stool on the fifth day. Abdomen soft, no new discharge of fluid. Patient passed in the further process of the sickness through a double-sided pulmonary hypostasis and a right-sided pleuritis, accompanied with high, irregular rise in temperature and requiring repeated aspirations. Complete cure after four weeks. Abdomen soft, no dullness anywhere, the liver margins in normal position.

We find here all the symptoms of a lesion of the gall-ducts. This diagnosis indicated the necessity of puncture and subsequent evacuation by incision. The above proceeding was successful. Although the locality of the lesion could not be found with certainty, the secretion of gall into the abdominal cavity rapidly ceased. The patient was cured by the operation though convalescence was very slow.—Deutsche Med. Wochensch., July 1st.

(This is an admirable illustration of the comparative harmlessness of the escape of bile into the abdominal cavity and corroborates the instances reported in the editorial in the August Annals.)

V. Laparotomy in the Tubercular Peritonitis of Infants. By Henri Hartmann and Arthur Aldibert (Paris). These authors report their personal cases and tabulate forty-five by other operators, making forty-eight cases in all where abdominal section was practiced for the relief of tubercular peritonitis. Of this number forty-six were cured and two died immediately, making a mortality of 4.16

per cent. Taking into consideration those cases where the improvement was sustained ten were still well one year after the operation and three two years after, making thirteen out of the forty-six who could be considered definitely cured.

The tubercular infection of eighteen of the cases in the table was proven by histological investigation. All these were cured and two were well after one year, three after a year and a half, and one after two years, making six cases of the eighteen, or one in three in which the cure may be regarded as maintained. Laparotomy acts not only by the removal of the fluid; for it is curative in the granular variety as well as in the ascitic form. It acts not only by the employment of lavage or antiseptic powders—for success has followed when these have not been employed. In all cases, whatever may be the mode of action of laparotomy in the tubercular peritonitis of infants, these cases show one fact to be certain, that it has a favorable effect.

They employ lavage with a boric solution which does not complicate the cure, and seems to be indicated, for it is certain that the complete elimination of the tubercular liquid is important now that it is known that even dead bacilli continue to exercise an energetic deleterious action. Drainage, except in case of suppurative peritonitis appears to us on the contrary to be contra-indicated. It is useless, and can only be the source of secondary infection and of intractable fistulæ, etc.

The operation is indicated when the tubercular peritonitis occupies the principal place in the tubercular manifestations. This year they have refused to operate upon two children, because in one the intestinal symptoms were absolutely rebellious to all methods of treatment, in the other because it presented some days after admission to the hospital signs of acute pulmonary tuberculosis.

On the contrary fever, far from contra-indicating the operations appears in the cases when it is principally caused by the peritoneal condition a formal and urgent indication whatever may be the form of peritonitis present.—Annales de Gynecologie, June, 1892.

VI. Operative Treatment of Volvulus. By H. Braun (Kænigsberg). If injection of water or insufflation of air, massage of

abdomen and punctures with fine needles do not bring about a speedy cure, B. recommends laparotomy. If even then reposition into the normal position does not readily succeed, it is very simple (and sufficient in many cases), to pass a tube into the rectum as high as possible for the evacuation of gases and liquid fæcal masses, and, eventually to scrape out the rectum, the abdomen having been opened. Incisions into the intestines with subsequent intestinal suture will be necessary in but few cases. Reposition having been accomplished, the reappearance must be prevented. Braun sewed the upper half of the sigmoid flexure of the colon to the left lateral abdominal wall, to an extent of 6 cm., with eight silk sutures in one case. Whenever the twisted piece has become gangrenous, it should, of course, be resected. It depends on each individual case, whether, after resection, a direct union of the two intestinal ends should be undertaken, or rather, Senn's enteroanastomosis, or the formation of an artificial anus. - Wiener Med. Woch., No. 27, July 2.

SAMUEL LLOYD (New York).

REVIEWS OF BOOKS.

AGE OF THE DOMESTIC ANIMALS. By RUSH SHIPPEN HUIDEKOPER, M. D. Complete in one volume of 217 pages, with 200 engravings. F. A. Davis, Philadelphia, 1892.

The author of this work although a regular graduate in medicine is evidently devoting at least the greater portion of his time to the study of domestic animals.

In a book well supplied with many full-paged illustrations he has produced a most interesting and instructive treatise on the dentition of the horse, ox, sheep, hog and dog. He approaches the subject with that boldness and minute attention to detail which one would expect from a person having his large field and the power of accurate observation and description. He feels that in preparing such a book he is supplying for the student and all others interested in domestic animals, something which up to the present time has been more or less neglected, at least in our own language. As a student himself he felt the need of just such a work, and the present volume is his attempt at supplying it. His ambition is certainly worthy and the result of his labor most satisfactory. Being one of the editors of a monthly journal devoted to the interests of the veterinarian, he naturally has kept himself abreast of his profession, and this is shown by the care and minuteness with which he has arranged the material at his command. One cannot regret that in a volume of 217 pages considerable more than half of it is devoted to the horse.

After a somewhat lengthy introduction, in which there is given a careful definition of age and its various periods, the author approaches the teeth of a horse, a consideration of which is to form the principal material of the book. His arrangement of the subject embraces no

fewer than nine chapters with a tenth one upon the various irregularities of dentition. He divides the age of the horse into three periods: First, the juvenile or period of growth, which extends from birth to the animal's full development; second, the adult or stationary period, during which the animal is at his best; third, the period of senility or old age. Under these headings considerable attention is given to the results produced upon the horse by overwork, improper feeding and unhealthy surroundings, and the effects these have in changing the general appearance of the teeth and causing an early decline. He divides the teeth into three varieties, the incisors, tusks and molars, and gives quite a minute anatomical description of each, beginning with the primary or temporary set and ending with those which are to become permanent. This division of the book embraces five chapters or periods, beginning with the first eruption of teeth soon after birth and follows their development, decay and replacement by new ones, and then the gradual wearing away of the crowns of this set as the animal passes from the period of adult life to that of senility. The only criticism that can be made here is that if anything, the subject is treated too minutely except for a student or one unusually well informed. After reading the book it is doubtful if the average admirer of the horse would feel any more confidence in himself if called upon to decide alone any special point as to a horse's age.

Under the heading, "Duration of Life of the Horse" there is found interesting reading concerning the principles of examination for determining the age and also the characters furnished by the teeth.

Irregularities of Dentition supply quite an exhaustive chapter the latter part of which is devoted to the effects upon the teeth produced by *cribbing* and closes by giving an account of artificial irregularities the results of a most vicious practice employed by the lower class of horse-dealers. Among the latter evils he mentions "Dressed Mouths," "Bishoping" and the removal of temporary incisors in order to age the horse. The balance of the volume is devoted to a consideration of the other domestic animals already mentioned and in which he follows the same general plan as for the horse although much more briefly.

The book as a whole is conveniently arranged, profusely illustrated and as a work for reference and general reading will commend itself to every sincere admirer of the domestic animals.

FRANK WHITFIELD SHAW, M. D.

ESSENTIALS OF MEDICAL DIAGNOSIS. By SOLOMON SOLIS-COHEN, M. D. and Augustus A. Eshner, M. D. W. B. Saunders, Philadelphia, 1892.

ESSENTIALS OF MEDICAL PHYSICS. By Fred. J. Brockway, M. D. W. B. Saunders, Philadelphia, 1892.

After reading the preface to the above books one feels himself quite disarmed in any effort to offer serious criticisms. The books have been prepared principally as aids to the medical student and in neither of them has there been any attempt at completeness. Both authors admit this to be true and advise careful attention to more elaborate works upon the subjects treated. By not losing sight of this fact the books immediately become valuable, the Medical Diagnosis particularly. The matter is fairly well classified, presents a wide-range of subjects and shows in its results an attempt to recognize new terms and the more advanced medical nomenclature. In one respect it offers the same fault that is seen in works of a much more ambitious nature. In some of its descriptions of chemical tests and technical methods there is a carelessness displayed which robs the book of some of its usefulness. The answers here given are too general and indefinite in character and while probably they would be accepted by the college examiner as indicating a knowledge of the subject, there is wanting that clearness which would make the book a valuable everyday assistant to a thoughtful and working student.

With this fault corrected the book becomes of interest not only to the student but to the general practitioner. It is a constant reminder of terms perhaps forgotten and where classical material is not abundant it helps to fix many points which are of great assistance in differential diagnosis.

Medical Physics is also a book arranged with questions and answers. It reminds one of the old New York University days when

Doctor Draper was accustomed to quiz the students in a similar manner from his well-known note book. There was considerable knowledge imparted during those years upon a subject usually considered burdensome to a medical student and the same will also be true in the case of every one who studies this book.

Both volumes are issued in a style uniform with the publisher's other question compends and it can be truthfully said that they fulfil the purposes for which they are intended.

FRANK WHITFIELD SHAW, M. D.

ON THE TREATMENT OF FLAT-FOOT.1

By WALTER C. WOOD, M. D.,

OF BROOKLYN.

ASSISTANT SURGEON TO ST. MARY'S HOSPITAL.

THERE seems to be a difference of opinion in the profession concerning the prognosis in a case of confirmed flat-foot. Some surgeons, assuming that a perfect functional result is beyond the limits of treatment, are satisfied if they succeed in relieving the most distressing symptoms. Others write confidentally of a "radical cure."

It is doubtless due to the frequent occurrence and crippling effects of flat-foot, and unfortunately to the present unsuccessful management of many a case, that we still possess such a multitude of therapeutic measures. In my endeavor to point out some of the indications and limitations of certain more or less familiar procedures, I am guided chiefly by personal observation of the work of others. Inasmuch as my experience in the strictly operative treatment of this affection is meager, perhaps I shall be considered as not giving due credit to the knife.

Although it is quite foreign to my purpose to deal with the pathology of this interesting condition, I desire to emphasize three features that seem of special importance in a rational consideration of treatment. First, that we have at the medio-tarsal joint a simple partial dislocation, and not a unique condition occurring nowhere else. We find the anterior surfaces of the os-calcis and astragalus displaced downward and inward; the astragalus to a greater degree owing to a tilting of these two bones from the abnormal direction of the transmitted weight. The posterior surface of the scaphoid and the cuboid are likewise displaced downward and inward. The ligaments are stretched, especially

¹Read before the Brooklyn Surgical Society, September, 1892.

important being the strong inferior calcaneo scaphoid, the chief support of the anterior end of the astragalus. In fact, in an extreme case it is the anterior surface of the astragalus which is partly concerned in forming the prominence on the inner side of the foot. Clinically, also the similarity to a dislocation is seen in the two classes of cases. In the paralytic or non-spastic cases a manual adduction and internal rotation of the fore-foot causes the deformity to disappear, and the same result occurs in the stiff flat-foot when a like position is obtained by a forcible reduction under an anæsthetic. Second, That we have a throwing outward or valgus of the fore-foot. Draw a line from a point which bisects the foot laterally at the medio-tarsal joint, backward to a point bisecting the heel. Also one forward from the same point to the middle toe. In the normal foot these two are one and the same straight line. In well-marked flat-foot the anterior line is deflected from twenty to forty degrees. Why this occurs is easily apparent. When the curve along the inner border is broken and approaches nearer a straight line any two constant points on this line become a greater distance apart; but as the outer border of the foot is practically without a curve, this lengthening on the outer side does not occur. Thus is the base of the forefoot on the inner side forced forward and the valgus results. This deformity must be recognized as clearly as is the breaking down of the arch, for unless the valgus is corrected, we have provided no support within the foot itself, for the anterior end of the arch. Third, That some flat feet are rigid and others are not. rigidity may be overlooked when slight, unless the movements of the foot are compared with those of a normal one. This rigidity in early cases is due to spasm, for it disappears on rest, later it results partly from spasm and partly from inflammatory adhesions between the tendinous structures, and in old cases to changes in the bony surfaces. The amount of stiffness is an indication of the severity of pain. Its relation to the application of mechanical supports will be mentioned later.

Methods of treatment easily group themselves in three classes, according to the mechanical principle involved. First, those that strengthen the arch by means directed to its bony framework; second, those that transmit the weight of the body through the outer border of the foot and thus relieve the arch;

third, those that support the arch directly by pressure. In the first class we have Ogston's operations and its modifications. A bony ankylosis is obtained in part of the medio-tarsal joint by a resection of the adjacent surfaces of astragalus and scaphoid and their fixation in a correct position, according to Ogston, by ivory pegs. Surgically this is not difficult, nor is it a dangerous operation with asepsis. It is applicable only to severe cases. It requires, according to its originator and others, a three months' rest in bed, else there is no practical assurance against a relapse.

Dr. Ogston reported cases where the pain was not relieved. One case where the ivory pegs were extruded, and several where the deformity recurred after several months with increasing pain. Yet, on the whole, patients were relieved by the operation. I recall but one case that I have been able to follow completely. but I fear it is a somewhat typical one. The operation was easily accomplished and there were no wound complications. When a second plaster splint was applied after two weeks the wound was healed and the position excellent. After the regulation time the patient began to walk, but with some pain. When seen about a month after discharge from hospital the deformity had recurred completely and the pain was severe. In a second case I saw a relapse several months after an Ogston's operation. Several well-known surgeons tell me that even their best cases have never been quite satisfactory. Whether this experience is universal or not I do not know. Although widely published in the Lancet in 1884, it does not seem to have gained an equally wide popularity.

I would call attention to the evident fact, that a three months' rest in bed even without operation would be expected to improve a flat-foot case, when the etiological factor is so often overwork, or rather overstanding, in an ill-developed youth.

Hare's operation would exclude the pegs and mortise the bones by an irregular section. This must shorten the foot, but removes the possibility of necrosis.

Kelly recently proposed to remove a wedge from the scaphoid and cuneiform bones. The idea seems illogical and inconsistent with the pathology. I do not know that it has been done. Golding Bird's old procedure of excising the astragalus need only be mentioned.

In these and similar procedures the highest attainable result is a stiff and painless foot; yet in practice this is often not the only exception to a radical cure.

According to the second mechanical principle mentioned, Mr. Thomas, of Liverpool, in 1886, published the following method: To raise the inner side of the sole of the shoe sufficiently to throw the weight on the outer side of the foot.

The arch is thus relieved and the pressure is transmitted

through the cuboid instead of through the scaphoid.

A few details are important. The building up of the sole must extend from the extreme posterior limit of the heel to the ball of the great toe, and not beyond, so as to permit the toes to rest firmly on the ground. The height of the added sole should be one-third to one-half an inch on the inner side, sloping gradually to the outer. The shoe must fit snugly or else the foot will slide inside and not be twisted or "rolled over." Many cases at the Ruptured and Crippled Hospital are treated in this way and our general impressions concerning its sphere of usefulness are confirmed by a detailed report published in 1890 by Dr. Townsend giving the results in twenty-five cases that could be well followed.

We have here an excellent therapeutic measure applicable even to the poor who must, if possible, continue at work. It is simple and cheap but it has its limitations. If we roughly divide the cases into three classes according to the severity, in the milder cases we expect a most satisfactory result. These are those where there is a slight sinking of the arch, where pain is present only after standing, and the chief complaint is that the foot is easily fatigued. There is very little stiffness in these feet and twisting is not painful. The improvement begins within a few days, after a short time there are no symptoms and after a few months the patient can return to his ordinary shoes with no further trouble. Inasmuch as these mild cases if neglected become crippling, I should like to emphasize the success of this simple measure. In the moderately severe cases also much can be accomplished by Thomas' method. Cases of several months duration with severe pain, well marked deformity and stiffness

can be treated in this way if the patient is taught to manipulate his foot every night. He should with his hands rotate the fore foot inwardly and adduct it, and while holding it thus should flex and extend it, all the while forcibly twisting the foot in exactly the opposite directions to that taken naturally by the deformity. A few minutes thus spent brings such marked improvement that the patient continues it daily without urging. After wearing the shoe a year or so the patient will consider himself cured and discard it. However, the surgeon will recognize that the deformity in part remains, and after a time there may be a return of pain that will admonish the patient to wear his Thomas shoe for a longer period. In the very severe cases, however, those spoken of by some authors as acute or inflammatory flat-foot, where the valgus is pronounced, the spasm continuous, and the pain severe, this method has proven entirely inadequate and cannot be recommended.

A second method founded on this same mechanical principle is the supra malleolar osteotomy of Trendelenburg, introduced here by Dr. Willy Meyer of New York, who reported two cases in 1890.

Reasoning from its successful employment in correcting the "traumatic flat-foot," so called, following a badly reduced Pott's fracture, he was led to employ it in the idiopathic cases.

A simple bow-leg is produced by a cuneiform osteotomy of the tibia about two inches above the ankle joint. Impressions of the foot taken after the operation show that the weight is transmitted entirely through the outer border and the arch has no contact with the ground.

Indirectly both this and Mr. Thomas' method correct the eversion of the fore-foot by the counter pressure of the transmitted weight along the outer border and thus crowd back the anterior end of the arch. The three patients that I have seen were all greatly benefited by the operation, but said they felt unsteady in walking. However, that might disappear in time. Theoretically it would seem that unsteadiness would inevitably follow if the angle in the tibia is so acute that the patient walks entirely on the outer border, while if less acute, so that part of the weight is still transmitted through the arch, a further breaking might result, yet it seems as if this operation offers much encouragement for severe cases.

The third mechanical principle, viz., support of the arch by pressure is applied in so many ways that we mention but few. The elliptical steel spring, known often as Tiemann's, and the stiff steel supports made according to the shape of a normal foot are all useful if applied in selected cases. The point is this: When there is no spasm, that is in cases where the foot is not stiff and returns easily to a correct position by pressure, they are all satisfactory. But many of us have occasionally been disappointed in having a patient complain bitterly of the pain caused by these irons or pads and refuse to wear them. But this occurs only in feet more or less stiff.

However, by a proper preparatory treatment these supports can be made applicable to any case. Some years ago Mr. Willett, in the eighteenth volume of the St. Batholomew Hospital Reports, advised for these stiff feet a complete breaking up of all these adhesions and a reduction of the deformity under an anæsthetic. I do not think that this procedure as a preliminary step to the application of a mechanical support has been sufficiently dwelt upon. If it is possible to reduce this partial dislocation and then retain it by an efficient support, where is the field for an Ogston's operation? Personally I have yet to see this manual reposition fail when intelligently, persistently and forcibly attempted.

Certain details are important if it is to be successfully done. The anæsthetic must be pushed to the full surgical degree.

While the heel is firmly held an attempt is made to move the medio-tarsal joint in its full physiological limits, the fore-foot is flexed and extended, adducted, abducted and rotated with firm pressure in each direction, oft repeated. The adhesions are heard to snap and the range of motion increases. The foot must then be retained in a well padded but tightly fitting plaster splint in a strongly adducted and internally rotated position—in fact, in a position exactly opposite that formerly assumed by the flat-foot. This over-correction can scarcely be made too forcibly. The pain following is not severe and seldom lasts more than a day or so. The plaster should be left on a week and when removed the foot will be found in a fully corrected position but stiff. Any well-fitting brace can now be applied and a system of massage and manipulation inaugurated. The purpose is to re-

gain free and painless motion in all directions and the normal functional elasticity. I quote from Dr. Royal Whitman, of New York, who has given these cases a great deal of attention: "The foot is first immersed for ten minutes in hot water, afterwards vigorously massaged, especially about the dorsum and is then slowly forced into a position of adduction. * * * This inward twisting is at first resisted by a mixed voluntary and involuntary muscular spasm which gradually gives way under steady pressure. When the limit of adduction has been reached the foot is firmly held until all pain has subsided, when the patient is instructed to make voluntary movements of flexion and extension. The foot is then released and twenty minutes of voluntary exercises follow and at intervals during the day the patient by active muscular efforts and passive motion constantly works to one end, namely to regain the lost power of adduction while once daily the twisting is performed by the surgeon."

During the ten days more or less, while this active massage is being performed, the patient is allowed to walk a little, wearing whatever support has been selected. The most satisfactory in practice and the most scientific in theory of any support with which I am acquainted is the brace advocated by Dr. Whitman.

In each case it is made on an iron mould with the cast of the foot in the corrected position as a model. This cast is taken a few days after the twisting, by removing the plaster splint for the purpose. Another plaster splint is usually applied until the brace is ready. This steel brace extends from just behind the ball of the great toe to a point in front of the inner tuberosity of the os calcis, thus the foot rests on its normal supports, the inner flange reaches to a point in front of and a little below the internal malleolus, while the small outer one fits in behind the base of the fifth metatarsal. The weight on the outer border forces the inner part of the brace snugly up against the weak arch. The time required from the date of the anæsthesia until a patient can walk about with some comfort on these well-fitting supports is about three weeks. In a foot without stiffness of course they can be applied without the preliminary twisting and massage.

These braces should be worn some six or more months depending on the severity of the cases, during which time the patient should himself continue the twisting and massage.

They can then gradually be laid aside. The ultimate result is a flexible foot in a correct position without pain and can justly be considered a radical cure. Although the proper application of this brace requires some skill in the use of plaster of Paris and a wise attention to the details of massage, the results warrant its use in an important case.

Let me emphasize the wisdom of forcibly twisting under an anæsthetic, and of the subsequent massage for any case of flat-foot with stiffness, no matter what mechanical appliance is chosen. Lack of time forbids my mentioning other appliances acting according to the same mechanical principle. In conclusion let me urge the importance of an early recognition of this trouble. In any case of pain in the feet and ankles not easily explained, a careful examination should be made, bearing in mind the insidious commencement of flat-foot. Too often the early cases are given a prescription for rheumatism and assured that the pain will wear itself out.

CASE OF JACKSONIAN EPILEPSY, THE RESULT OF AN OLD DEPRESSED FRACTURE OF THE SKULL, RELIEVED BY TREPHINING.

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HE patient, F. T., age 19, height 5 feet 4½ in., weight 112 lbs., a pale, delicate, nervous looking youth, consulted me for epileptic attacks on the 10th of July, 1890, giving the following history:

Family History—Good, no nervous specific or rheumatic trouble ever known in family.

Previous History-Always enjoyed excellent health until October, 1883, when, while picking nuts, he fell a distance of about 15 feet, striking the right side of his head on a stone, thus cutting the scalp. He was unconscious for three or four minutes, then got up and walked home, a distance of one mile. He went to a surgeon's office, who stitched up the wound and sent him to bed, where he remained a week. Pus was discharged from the wound during this time and the patient suffered considerable pain, which was intensified by light and sounds. On about the ninth day the patient was allowed up as he appeared much better. After being up an hour, however, he had a convulsion. He was placed in bed and the surgeon sent for, who, ten days later, removed several small pieces of bone from the skull beneath the site of the original wound. The patient improved and in six weeks was able to walk around and then to work. The following spring he appeared quite well, but his left arm was not quite so strong as formerly.

Two years later, patient noticed a twitching in the index finger, which extended to the other fingers and thumb of the left hand. This twitching at first lasted about one minute and was accompanied by pain which would almost make him cry out. One attack was followed quickly by another, the fingers being suddenly and violently flexed. These attacks would come on at any time, one, two or more occurring in a month. This condition became gradually worse during a period

of four years, until June, 1889, when, after playing ball one day, the patient felt a peculiar feeling in his head, followed by a violent flexion of the left forearm, together with great pain in the muscles of the whole upper extremity. He then became unconscious and remained in that condition for 8 or 10 minutes. He recovered from this attack in a few minutes and remained well until a second attack, which occurred two weeks later. This time he was conscious, but all of the muscles of the left side were affected. After this the patient could not leave his house with safety as an attack might come on at any time, but during the cold weather he improved, although his appetite was poor. He had frequent nocturnal emissions and became very nervous. Every two or three weeks he would have a severe attack, which invariably commenced in the fingers of the left hand, extended up the arm to face and down the leg of same side. The tonic spasms were succeeded by clonic ones, and at times the whole body was thrown into convulsions, in fact this became the rule.

On 28th June, 1890, the patient had a very bad attack, the convulsions were general, and was followed by unconsciousness which lasted an hour. Since then until 23rd July they were only light attacks. His intellect was much dulled after an attack. He always had an aura in the form of a scum before his eyes, followed by giddiness, etc.

Present Condition—The patient is a pale, nervous, intelligent looking boy with poorly developed muscular system. Lungs expand fairly well, basic systolic murmur heard over pulmonary area. No organic disease of heart or lungs. Eyesight good, fundi normal. Over the lower part of motor area, on the right side of head, is a crucial cicatrix, and it gives the patient pain when pressure is made over this region. There appears to be some depression here. The muscles of the left side are weaker than normal and there is a difference of 2 cm. between the measurements of the two sides. Sensation normal.

From the 23d to 27th July patient had about twenty epileptic attacks, some of which were very violent.

July 27, 1890. Patient prepared for operation in usual way, head shaved and cleaned with soap and water, alcohol, etc. It was quite evident after the head had been shaved that there was depression of the skull beneath the old cicatrix.

July 28. Patient given one-sixth gr. morph. sulph. hypoder-mically and chloroformed, a curved incision made commencing three-fourth inch behind and one-half inch above the external angular process of the right frontal bone, curved upwards to parietal eminence then backwards for about three inches, then down to a point a little

above the ear. This flap, marked in the centre by the old crucial cicatrix, was then reflected, everything being separated from the bone except periosteum, and the vessels caught with hæmostatic forceps. There was then exposed a thick fibrous membrane, three-fourths of an inch square, which bridged over the opening made in the skull at the previous operation, seven years before. The periosteum was now separated from the edges of the opening in the skull and the bone was found depressed for an area of about three-fourths of an inch around the original opening. The thick membrane which filled up the opening was separated and about 4 cc. of serous fluid escaped. This fluid was localized between the membrane and dura mater. On completing the separation of this membrane from the bone, considerable blood welled from some of the divided branches of the middle meningeal artery. The dura mater was separated sufficiently from the skull and the depressed portion removed with bone forceps. There was considerable hemorrhage. The dura mater was divided and cut vessels tied with fine gut with the exception of one bleeding point at the upper and front part of the wound between the dura mater and bone, which had to be stopped by plugging with a small piece of sponge. The brain exposed presented a healthy appearance, except a point corresponding to about the middle portion of the ascending frontal convolution, which was somewhat darker in color and slightly depressed. The bleeding having been all checked, the dura mater was drawn together with a continuous catgut suture. The pieces of bone which had been kept after removal in a warm solution of acid boracic were replaced, lying on the dura mater, all the small pieces being fitted in between the larger ones. Two small gut drains placed in with strands spread among the fragments of bone, flap replaced and stitched accurately, except a short distance at the lower and back part of the wound where drain escaped, completed the operation. The regular moist dressing of bichloride gauze and sterilized cotton was applied and patient placed in bed. Time, forty minutes.

The temperature was taken every six hours, and the highest point it reached was 101 degrees F. nine hours after operation. Urine was removed, once by catheter, evidently the effect of the hypodermic. He was given some potassium bromide for two nights following.

Aug. 2. There was a little twitching in his arm, dressed wound, removed all of the stitches, healed nicely except point where gut drain escaped. There seemed a little fulness beneath flap and hence a director was passed in alongside of drain and about fifteen drops of serum escaped. The patient felt better, slept well and had a good appetite. He was allowed to sit up on the seventh day, and walked

half a block on the eighteenth. He gained flesh rapidly, and soon appeared like another person. No bone ever came away. He entered the City hospital on the 23d of August, and answered door and telephone. In October he had a slight attack of pleuritis. He had a slight fit in November, but had been working hard collecting accounts.

I saw the patient frequently during the year 1891. He worked steadily, but about every two months he would have a slight epileptic attack, and on one occasion when attending a circus on a hot day and in a big crowd, he had a severe attack. Since that time he married and has been in steady employment as bartender. He informed me a few days ago that he occasionally has a slight attack. It is now two years and nearly three months since operation.

EDITORIAL ARTICLES.

OBSERVATIONS UPON HERNIA AT THE LAST MEETING OF THE ITALIAN SURGICAL SOCIETY.

In the Archivio ed Atti della Società Italiana di Chirurgia, the first volume of which has just appeared, the question of hernia is discussed by Doctors Bottini, Tricomi and Postemski.

The first discusses the treatment of abdominal herniæ. The occlusion of the hernial aperture having proven uncertain, the natural desire is for some method that will prove a real restitutio ad integrum. In the method employed by Bottini the question of the disposition of the sac occupies only a secondary position. It may be exsected or simply split up, or even left in place. In congenital herniæ it is usual to split open the sac and cut off the exuberant peritoneal flaps. In acquired herniæ the internal orifice is closed and cut away from the sac which is not dissected out.

The same method is employed in any form of inguinal hernia, whether free, incarcerated or strangulated. The internal opening is always carefully closed. When the hemorrhage has been carefully arrested drainage is rarely required. The successful closure of the opening can be determined by having the patient cough while the forefinger closes the internal inguinal ring; wherever this coughing shows a spot of less than normal resistance, it is strengthened by an additional catgut suture.

No belts, or trusses are employed except temporarily and so far there has been no relapse.

The operative technique for the inguinal region is as follows:

- 1. Opening and isolating the hernial sac.
- 2. Reduction of the hernia, and opening and excision of the sac.
- 3. Closing the internal ring by one or more interrupted sutures.

4. Methodical union of the borders of the wound. The pelvis is raised and the patient turned so as to bring the affected inguino-crural region, which has been previously shaved, into full view. A linear incision is then made along the inguinal canal in the direction of the scrotum as long as the volume of the hernia requires. The structures are then divided down to the neck of the hernial sac which is carefully dissected away from the surrounding tissue. The hernia is then reduced and the sac cut or excised according to circumstances.

In closing the wound two Hagadorn needles, threaded upon the same strand of catgut, are employed. One needle is first passed from the inside out so as to control not only the free border of the obliquus internus and transversus muscles but also the aponeurosis of the obliquus externus. The other needle is then thrust into Poupart's ligament and drawn through until the loop is free. It is then carefully tied. A second and sometimes even a third loop may be found necessary. Whenever the apposition is complete the loops are tied with a double knot and the ends are cut off. The patient is then allowed to come out of the anæsthetic and made to cough while the forefinger presses against the closed ring, and whenever there is a defective or doubtful point another suture is carried through from the outside.

Hemorrhage is then absolutely arrested and the wound is washed out. The external wound is closed by means of sterilized hair sutures.

In fifteen days the wound is usually completely united and the patient is allowed to leave his bed without retentive apparatus of any kind.

In umbilical herniæ of small size with narrow orifices only a ventral knotted suture is necessary, but in single herniæ two sutures are employed.

The author claims that his method "abolishes entirely the use of trusses and restores to the abdominal walls their normal resistance to hernia."

Tricomi at the same meeting reported four cases of crural hernia which were cured and in which he employed the following method: A longitudinal incision beginning 3 cm. above the Fallopian ligament descends obliquely downwards and inwards—laying

open the aponeurosis of the obliquus externus above and the fascia lata below.

The sac is then freed and opened after the reduction of the hernia and ligated at its mouth (neck) and then cut away in front of the ligature. The internal opening of the crural canal becomes evident when Poupart's ligament is drawn upwards by an oblique hook. A Hagadorn needle and a strong silk are then employed to gather this part of the canal ("tobacco bag suture") including Poupart's ligament in the first loop at the upper wall of the internal opening of the canal. The second loop then includes the vagina vasorum, the third the pectineal fascia and the pectineus muscle, the needle keeping close to the bone, the fourth Gimbernat's ligament and the fifth Poupart's ligament at the original point of the suture. The two ends of this suture are then drawn tight when all the loops approach one another; the pectineus rises, Poupart's ligament descends, and the internal aperture of the canal is obliterated. The two ends of the suture are then tied firmly. When this is done there still exists a slight depression, the borders of which are united by another drawing thread suture with five loops, The surface layer of the fascia lata is then sutured to its pectineal portion by four interrupted sutures, the upper one including the arch of Poupart's Ligament at the point where the drawing thread sutures are inserted into the ligament. There is consequently a triple suture occluding the internal opening of the crural canal. The skin is finally united by interrupted silk sutures. No drainage is employed. This technique applies to the left side. When the hernia is on the right, the first loop of the suture includes the internal part of Poupart's Ligament, the second Gimbernat's Ligament, the third the pectineal fascia and pectineus muscle, the fourth the vagina vasorum, and the fifth Poupart's Ligament near its terminus. Of the four cases operated upon after this method all have remained well for six months.

Finally Doctor Postemski presented a series of observations upon 170 cases of inguinal hernia. Of these, 137 were oblique complete congenital herniæ; 49 were acquired (5 of them incomplete). Of the

¹(Although the title of this paper, refers only to 170 cases, the statistics indicate 186. These figures are repeated several times and there is no explanation of the discrepancy.)

congenital cases, 44 did not have a hernial sac, *i. e.* with a persistance of the vagino-peritoneal canal, and in 93 there was a closure of that canal at various distances from the testicle.

In the 49 cases of acquired herniæ, 40 had pendulous lipomata of varying sizes. The greater number of the cases revealed the fact that a congenital defect is the most common etiological factor and that herniæ of the acquired type (strictly speaking) are rare. Out of the whole 170 cases only 9 showed no sign of a congenital predisposition to the formation of the hernia. One cause for the irreducibility of a large congenital non-strangulated hernia was found to be the formation of a second incomplete sac. The hernia was omental entirely and descended into the scrotum, a second mass escaped into the canal and the original hernia formed a sac about it where it had wedged itself into the original hernial protusion. This so increased the mass of the hernia that reduction became impossible.

SAMUEL LLOYD.

SCHEDE ON THE SACRAL METHOD OF TOTAL EXTIRPATION OF THE CARCINOMATOUS UTERUS.

In a memoir in the second volume of the Annals of the city hospital in Hamburg, M. Schede discusses historically and clinically, the sacral method of total extirpation of the carcinomatous uterus. His statistics are constituted by twenty-eight cases operated upon by this method. In view of the comparatively little attention which the method has received in this country, a resume of his contribution is herewith given.

He goes on to say that carcinoma of the uterus is such a common disease, its natural course is so fearful, and the necessity for radical and, indeed, for palliative means of treatment, is so extraordinarily great, that very naturally every advancement in this direction has been sure of the greatest attention and undivided interest. So the method of curetting and cauterizing, introduced by G. Simon, notwithstanding its purely palliative character, was a very great advancement when compared with the inefficient and fruitless therapy of that

time; and was, after an almost incredibly short time, in general use. Freund's bold and extremely difficult, and much too dangerous operation, excited the highest interest throughout the whole medical world. The first report concerning the classical attempt to remove the uterus through the vagina, which Czerny made in 1879¹; the the three operations performed by Billroth, which Wölfler reported; and the two cases reported by Schede in 1880²; introduce the literature on the subject of vaginal hysterectomy.

This operation itself is to-day an assured thing. Its statistics already include thousands of cases; nor is it, when discriminately done, a dangerous operation. Furthermore, there is scarcely a doubt but that the number of cures is becoming larger. This is especially illustrated by the very brilliant results obtained by Leopold; of whose eighty cases operated upon, not less than forty-five-56.25 per cent. -were alive and well two to seven years after the operation; while of those who died, eight perished from intercurrent diseases, which had nothing to do with the uterus carcinoma. But still enough recurrences have been observed in cases, which, according to their condition at the time of operation, seemed to offer the most favorable chances. It must also be generally conceded that the better prognosis of the operation, as well in relation to the danger to life as to the recurrence occurring in a very great proportion, is due to the fact that the cases which present the greatest difficulties to extirpation, cases in which the parametrium is not entirely free from growth, and in which the uterus is more or less fixed, are, as a matter of course, excluded from the attempt at radical cure.

Schede states that, it is certainly not his intention to dispute the necessity of placing such limitation upon the application of operative interference for the disease, as science is in the position to demand. Those who are familiar with the recent history of the vaginal extirpations for carcinoma of the uterus, will not be able to exclude themselves from the impression that, the incentive for the new operation to help the poor women suffering from carcinoma and to avert their fearful fate, has led, in the beginning, every humane operator to go

¹ No. 45, der Wiener Medicinische Wochenschrifte.

² Congress der Deutschen Gesellschaft für Chirurgie.

too far in a realm of which little was known; and that, a high percentage of mortality should be placed to the account of the place of election for the performing of the operation. Of this fault, if it may be regarded as such, Schede acknowledges that he is unable to acquit himself. A glance at the clinical histories reported by Dr. Walter teaches that only in about half of the cases was the carcinoma limited to the uterus, and that his mortality statistics would have been very much better had he drawn narrower boundaries to his attempts to radically remove the carcinomatous uterus.

In a new operation should not only the indications, and the limits of the technical possibilities first be established, but also the finer helps in diagnosis, which give an exact judgment as to whether given cases come within these limits. These, when once apparently established, are not entirely immutable. Greater experience and improved technique sometimes result in great extension of the possibilities; and what, in the beginning seemed entirely unattainable, is later accomplished with no very great difficulty. Such being the case, he who observes the already established possession can glory in better operation statistics. But he who strives to broaden it, who leaves the beaten paths, will have to be contented when he discovers that this or that step in advance proves itself too bold, and must be He experiences, however, the satisfaction of bringing rescue where nothing further seemed possible, and perhaps of paving the way for great advancement.

In the question of the total extirpation of the uterus, the author says, that he has stood and to-day stands, without reserve, on the standpoint of Schauta. ¹ The possibility of the operation presupposed, he would, in each positively diagnosed carcinoma of the uterus, do the total extirpation, and reject any partial operation; on the same grounds as, for example, the isolated extirpation of a carcinomatous nodule in the breast is rightfully condemned, and every carcinoma of the breast, however small, treated by a total removal of the milk gland, and a careful cleaning out of the axilla; as is doubtlessly right and rational. Such an operation should be done where it can be hoped

¹ Arch. für Gynækologie, 31, 1.

to remove all disease without greatly endangering life, and which threatens life less or impairs its usefulness less than an existing carcinoma.

To be sure it would be better, and we would thereby be saved discussion in the latter direction, if patients allowed themselves to be examined earlier, and physicians could make an early diagnosis, and perform a total extirpation. The mortality would then be not much more than zero, and the ultimate cures would reach a very high percentage. Considering, however, the ever present facts in the case, that surely more than half of the women suffering from carcinoma of the uterus first seek medical help when the favorable time for a radical operation is long past; when, perhaps, the vagina is partially involved, when the uterus is no longer freely movable, the parametrium infiltrated, and the retro-peritoneal glands the seat of secondary deposits. In the face of these facts, it is hard for any one to trifle with the task of possibly extending the limit of our knowledge, in order to rescue still a portion of these unfortunate women, whom careful surgeons have resigned to their fate.

He, who has always endeavored to extirpate the carcinomatous uterus by the vagina, has learned the enormous difficulties with which the operator step by step has to combat. The simple contraction of the parametria, as a result of old inflammatory processes, the cicatricial shrinking of the broad ligament and sacro-uterine ligaments, render the operation much more difficult. Because of the diminished movability of the uterus, each succeeding step must be carried on at a greater depth and by poorer light; and the difficulties are aggravated by the short, dense adhesions of the parametrium. Self evidently the cutting around the uterus must be done much nearer that organ than is desirable in the interest of a lasting result.

Real carcinomatous infiltration of the parametrium or of the ligaments, which can be more easily diagnosed by the bimanual method through the rectum and abdominal wall than by the vagina, as irregularities in the form of larger or smaller inelastic nodules or thickenings, must be regarded as an absolute contra-indication to the vaginal operation. And naturally the same may be said of any evident infection of the peritoneum or retro-peritoneal lymphatics.

It is much more difficult, though not impossible, to establish the diagnosis before the operation as to the extent of the growth in the direction of the bladder, and how far the lower end of the ureter is from the neoplasm or is already involved. The movability of the uterus is not diminished by adhesion to an organ so movable as the bladder, and bimanual palpation of the abdominal wall, vagina, and rectum, give only uncertain results. Surgeons who do not limit themselves to the most favorable cases, are sometimes very unpleasantly surprised at the extent to which the carcinoma has already gone in the direction of the bladder and around the uterus. If in such a case one wishes to do a thorough operation, as is necessary, if every hope for the result is not lost sight of, the ureters must be exposed for a considerable distance, as is done for example with the axillary vein in removing a carcinoma of the axilla. Then the difficulties of the vaginal operation tower so high, that in by far the most cases the discouraging impression of a useless task is made, and the zeal of the operator so dampened as to deter him from renewed attempts.

The case becomes an even more difficult one when the carcinomatous extension has taken the less common course into the retrorectal cellular tissue; while the destruction of the peritoneal pockets before and behind the uterus, and other purely inflammatory growths, which in themselves are not so difficult to overcome, but in connection with the other difficulties with which they accidentally occur, may become, in the highest degree, unpleasant obstacles.

According to all of these things there can be no doubt but that the vaginal method of uterus extirpation, in which such brilliant progress in the treatment of carcinoma of the uterus has been made, does not fully satisfy the demand which the surgeon is wont to place upon an operative procedure for the removal of a malignant tumor. A procedure which really does good in only the simple and smooth cases; and in which, in every complication and in every extension of the growth into the surrounding tissues, the technical difficulties increase in an entirely disproportionate ratio: a procedure which in such cases above all is found wanting, can certainly not be regarded as an ideal one. A clear view of the field is especially important in operations for carcinoma, and it is a natural wish to possess another operation

for the more difficult and advanced cases: an operation which in the main offers the safest possible extirpation of the disease.

Similar ideas will have presented themselves to every operator who has ever been in the position to perform a difficult vaginal extirpation of the uterus. And it is much to be wondered at that the bold and interesting attempt, which Hochenegg¹ made, to come upon the carcinomatous uterus by the sacral or pararectal way, by sacrificing the coccyx and a small portion of the sacrum, met apparently with so little recognition. It is now so long after the original publication that one may conclude that it had scarcely any result. Of the surgeons only Czerny², and Rose³, and of the gynæcologists only Hegar, who was the first to attempt to turn to account for gynæcological work Kraske's idea, and more recently Peter Müller, have performed the operation.

It may be regarded, a priori, as almost amounting to folly to construct an artificial entrance to a diseased organ, by means of a large and complicated wound, when a natural entrance stands wide open. Schede states that at first the logic of the procedure did not seem quite clear to him; but if it goes with every one who performs the operation for the first time as it went with him, the great advantage of the sacral way over the vaginal way will immediately become clear. These advantages, he says, will be best emphasized by a description of the operation as he has been accustomed up to the present time to employ it.

The patient is placed according to the method of Bardenheuer, who first advocated placing the pelvis in an elevated position for the sacral resection of the rectum. In this dorsal position the pelvis should be well elevated, and the thighs strongly flexed upon the abdomen. With a long median incision, beginning two or three centimetres from the anal margin, the coccyx and a small portion of the sacram are exposed. The former and the portion of the sacram

¹ Wiener klin. Wochenschrift, 1888 and 1889.

² Verhandlung der Section für Gynækologie auf dem 10. internationalen Aerzte-Congress, Berlin, 1890.

³ V. Mass: Amputation des Wirbel canals zum Behuf deshinteren Bauchhöhlenschnittes. Deutsche Zeitschrift für Chirurgie, XXXII, 3, 1891.

vertebræ below the last sacral foramina are removed with the bone cutting forceps. As yet, he states, he has never found it necessary to go so far with the resection that the lower sacral foramina with their nerves were in the way. No important nerves are injured by the operation.

The author regards it as his duty to especially emphasize this fact, and to offer a strong protest against the extent to which Rose carries the sacral resection, as a regular procedure in all cases, even when there is no urgent necessity. A comparison of the clinical reports of Mass and Schede will show that the latter has operated upon much more difficult and complicated cases than have Mass and Rose. Among all of his cases was only one in which a more extensive resection of the sacrum was found necessary. This case was one in which the retrorectal cellular tissue was extensively infiltrated with carcinomatous growth, and access was more readily accomplished through a larger resection, and the operation thereby greatly facilitated. In all of his other cases the operation was completely and easily performed through the smaller resection, which was carried as far as it seemed necessary; and it never once occurred to him that it would have been desirable to have sacrificed any more of the sacral bone. Nor has he, for a moment, entertained the idea of carrying the operation to the extent which Rose carries it, or even to the extent which he himself has carried it in the great number of cases of carcinoma of the rectum. And for the great majority of cases he regards Rose's "amputation of the spinal canal," as entirely superfluous.

He emphatically disputes that the loss of the three lower, or even of the two lower, anterior sacral nerves is such an unimportant matter. All of his cases operated upon for rectal carcinoma, in which on only one side the third, and even all, in which only the fourth and fifth sacral nerves were sacrificed, complained for weeks and months of paralysis of the detrusor vesica urinaria; and although in all the rest the function was finally restored, two of the twenty-nine cases operated upon perished of extensive diphtheria of the bladder, unquestionably due to this paralysis. Disturbances of the detrusor function of the bladder, lasting for weeks, were not uncommon occurrences in his sacral uterine extirpations, in which only the fifth

anterior sacral nerve was cut. And he believes that the anterior sacral nerves are not so completely devoid of physiological importance as Mass thinks.

In this first step of the operation a considerable loss of blood sometimes occurs from the division of the median and lateral sacral arteries, and from the branches of the inferior gluteal artery in the succeeding bilateral division of the tuberoso-sacral and spinoso-sacral ligaments. At other times this part of the operation, which usually is the most bloody, progresses almost without a drop of blood; and the elevated position of the pelvis proves itself, in like manner as in the rectal resection, such a potent means of limiting the hemorrhage that sometimes during the whole operation scarcely an occasion arises, aside from the uterine arteries, for the ligation of a vessel. The individual differences of cases in regard to the hemorrhage are very great. Evidently the age of the patient in connection with other things plays a very important rôle, inasmuch as in the case of young persons who have reached the age of complete sexual development, all the parts which come into consideration are much more richly supplied with blood than in the case of older persons who have already reached the climacteric period. Still this rule is subject to certain variation, for proportionately in older persons, on account of weakness of the heart, all the pelvic organs are in a state of venous congestion, which renders the operation much more difficult or may even frustrate the result. Four examples of this sort are cited from his twenty-eight cases.

The next step of the operation consists in a blunt dissection, with the finger or the closed Cooper's scissors, of the tissue on the right side of rectum. Certain resisting structures may be cut through. The rectum should then be displaced to the left, and held aside with large blunt hooks.

The cervix and uterus can now be felt lying directly beneath the wound surface, and the posterior vaginal wall can very easily be brought back into the wound.

A sponge is now introduced into the vagina to press it towards the wound. The vaginal wall is then transversely incised on the sponge. The cut edges are seized with small four toothed Museux forceps, and the wall of the vagina cut completely around at a proper distance from the carcinoma. The upper segment, together with the cervix, may then easily be drawn into the wound.

The further detail of the operation is now not much different from the ordinary proceeding in vaginal extirpation, with the very great difference that each step is taken with complete accessibility to the parts, and with much better illumination; so much so, that the "mass ligatures" can generally be avoided when the indication for their use seems doubtful, and their application confined to sound tissue.

Here, indeed, has been until now a difficult point in the generally inadequate technique. If one divides the parametrium in a few large sections, the remaining stumps dare not be too short, or the ligature will slip off. In other words, the "mass ligatures" necessitate that the ligaments be cut closer to the body of the uterus than would otherwise be necessary. With the "mass ligatures" one works in the dark, and does not see exactly what he is doing. If their employment is renounced the surgeon can work farther from the uterus, is able to see each moment what he is doing, and will secure perhaps better chances for a lasting cure. At any rate a chief objection is done away with, an objection which is held against the vaginal extirpation of the uterus, and which has hindered surgeons in great part from interesting themselves in the operation; namely, the unsurgical working in the dark. How substantial may be the usefulness which comes from this the future will have to teach. In the preparatory cutting around the uterus, one works more slowly, but he has the feeling of a more certain procedure, which will, it is to be hoped, increase the per cent. of cures.

To this is connected the fact that the total extirpation of the uterus can be done in a large number of cases, in which, according to the competent view of the most skillful operators, one does well to renounce from the beginning every attempt at it, so long as he has no other recourse than by the vagina.

Schede previously used to proceed by drawing the fundus of the uterus out of the peritoneal wound in forced anteflexion, after having sufficiently enlarged the opening in the vesico-uterine fold, and in this position tying and cutting off the annexa. But now he draws down the uterus in its entire length, and completes the extirpation without inverting the fundus. If the carcinomatous part has not been cauterized before the operation, the latter procedure, in which the cervix is more easily held away from the peritoneum, is entitled, without question, to the preference. Otherwise it makes no difference whether the one or the other method is followed. Lastly, it is to be recommended that the ulcerated cervix be wrapped as far as possible in iodoform gauze.

The author attaches much value to a particular suture for the peritoneum. He hangs a number of long pincers on the edges of the peritoneal wound, which draw down the peritoneum. A running catgut suture is then applied. This is greatly facilitated by the diagonal jawed Hagedorn needle forceps. To the careful application of this suture, he ascribes, in large part, that the peritoneum never afterwards has to be considered.

The wound in the vagina must also be carefully sutured. Otherwise the vaginal mucous membrane would gradually become drawn into the sacral wound, and a mucous fistula would result; a thing, which in itself is not essentially objectionable, but which is unpleasant for the patient, and which can easily be avoided. After introducing a broad gutter shaped speculum, a single toothed sharp hook is placed in the wound angle in the right vaginal wall, and drawn slightly forwards. Then wound surface lays itself upon wound surface quite naturally, and the entire vaginal wound can be closed by a running catgut suture, in which an in-and-out stitch is made from the mucous membrane side. Healing per primam very easily follows. It has failed to occur only once for the author, in a very feeble patient, who soon after died.

The sacral wound is to be carefully packed in every crevice with iodoform gauze. The skin is then partially held together with a few silk sutures for the purpose of immobilization of the wound edges. Rest of the parts is thereby much insured, after hemorrhage prevented, and the shrinking and retraction of the skin to a great degree hindered. The iodoform tampon remains eight or ten days. Over all is placed a simple outer dressing, which consists of sterilized mull

and a large sublimate moss pad, held in place with a triangular cloth or diaper. This dressing takes up the superfluous wound secretion, and should be changed daily.

As already stated, many of the patients had difficulty in emptying the bladder. In nearly all it was necessary for the first two or three days to draw off the urine with the catheter. Sometimes the paralysis of the detrusor lasted much longer, but finally, without exception, disappeared. At the same time this transitory disturbance is not to be regarded with indifference. It is well known how difficult it is to prevent cystitis from arising in women who must be catheterized. Here we often have to do with cases in which a narrowing of the ureters exists at their lower ends, developed relatively after the operation, and in which cystitis, through the infection of such a ureter, and the accompanying kidney affection, can be the direct cause of death.

The author now introduces the clinical histories of all of his twentyeight cases of carcinoma uteri which were operated upon by the sacral method, and asks, what deductions can be drawn from these histories?

Of the twenty-eight cases, eight died immediately after the operation, or so soon afterwards that the operation, or at least the operation in connection with other complications, was the cause of death.

Among these eight were seven in which the operation was especially difficult, in which a large amount of blood was lost, and in which from the very beginning the operation progressed against very unfavorable circumstances. In three of the cases the loss of blood from greatly dilated veins was unusually great. Kidney atrophy was found in one of these, and another, fifty-eight years old, showed fatty heart and arterial sclerosis. A seventy-one-year-old woman, who was greatly reduced by the enormous hemorrhage, perished from the combined effect of the same with senile degeneration of the brain. It can be stated, without going further, that in these cases, the vaginal operation would have offered even slimmer chances.

One patient died of pulmonary embolism from thrombosis in the femoral vein. The same cause of death was found in another case, in which the amount of blood lost at the operation was very small. The author has observed three other cases—resections of the rectum—

in which thrombosis occurred in the femoral and pelvic veins, and sudden death from pulmonary embolism, following the operations in which the elevated position of the pelvis was employed. He does not doubt but that the slowing of the blood current in these parts of the body, which is caused by the elevating of the pelvis and the fixed flexion of the hip joint, stands in direct causal relation with the formation of thrombi. This danger is probably increased because the position is so advantageous on account of the hæmostasis which it accomplishes. The operator must decide whether he shall protect the patient from the one or from the other danger. Perhaps it may be circumvented by the construction of an apparatus for supporting the hips without over-flexing the thighs.

One of the three remaining deaths had the least connection of any with the operation. It was the case of a sixty-two year old woman, who before the operation had become very much prostrated, and in whom the autopsy revealed pleuritis, pericarditis, myocarditis, fatty infiltration of the heart, arterial sclerosis, atrophied kidneys, and hydronephrosis. Death occurred on the sixteenth day. In the other two, changes in the kidneys were found to account for the fatal result, which occurred on the twenty-third and twenty-sixth days. These lesions, which had begun before the operation, were aggravated by the injuries inflicted on the urinary tract. The free flow of urine from the ureters was hindered by the dense fibrous tissue formed about their lower ends or by their laceration and bending due to the suturing of a defect in the trigonum. Of these three cases can it only be said that they were susceptible to absolutely no operation, and that it would have been better had they been left unoperated upon.

Three of the twenty-one who survived the operation have since died. One perished from recurrence; and the other two from the result of operations done for the removal of recurrent growths. In both operations unforeseen difficulties towered one above another, and gave only the faintest hope that it will ever be of much use to attempt to deal with recurrences after extirpation of an uterine carcinoma.

Three patients are now living in whom recurrence has taken place. Some of the remaining fourteen have reached a probability of a permanent cure. In eight cases, from the time of the operation until the last examination, have elapsed respectively, 20, 16, 15, 9, 6, $5\frac{1}{2}$, 5 and 4 months. Three months have not yet passed since the other six were operated upon. It may, perhaps, be said that the first four have good chances for a permanent result.

Among these four cases it would have been absolutely out of the question, in the particular one which has now gone fifteen months without recurrence, to have attained such a result by the vaginal operation. The same may be said with some probability of the twenty month case. Four of the fourteen cases in consideration would have been good subjects for the vaginal operation. In still another the vaginal operation would have been entirely impracticable; while in five more it would have given, in all probability, much poorer chances.

From these cases Schede believes that the sacral method can help a large number of patients, for whom the vaginal method can do no good. The danger of the operation in itself, in smooth cases, is surely not greater than the vaginal method; the certainty of removing the disease is greater; and the limits of its application are much broader.

The duration of the healing process is generally longer. When it takes a most favorable course at least six weeks have to be counted on. This does not enter into the consideration so long as the certainty of the operation is greater.

The experience of Schede furthermore teaches, that, in cases in which the carcinoma has involved the bladder wall and in which a ureter is encroached upon, it is much better to cut out a piece of the bladder in doubtlessly sound tissue, resect the ureter, and extirpate the kidney, than to torment the patient with uncertain, thankless and dangerous conservative experiments. He performed this operation upon the case which has gone fifteen months without recurrence. The leaving of a doubtfully sound ureter forbids itself. One which has had its circumference laid bare for any considerable distance will eventually become necrotic, and lead to fistula. The shrinking granulation tissue will constrict it and cause kidney disease, which may easily be fatal. Ureter fistulæ are dangerous because of the easy possibility of kidney infection. In short, the operation gives the best chances by proceeding radically in every direction.

BOLDT ON VAGINAL HYSTERECTOMY IN CANCER OF THE UTERUS.

In a paper read before the recent meeting of the American Gynæcological Association by Dr. H. J. Boldt, of New York, the author, after describing the process by which he prepares his patient for operation, which is one of great antiseptic precaution, describes the method of operation to which he gives preference if it can be carried out. In cancer of the portio or the cervix, such portions as readily break down are removed by scissors and the sharp curette, then the uterus pulled down with volsella, but where no portio is left to grasp with volsella, the vagina surrounding the cervix is grasped anteriorly with one or two bullet forceps, half an inch or further from the cervico-vaginal margin, and an incision is made as far away from the cervix as he considers necessary to resect the vagina, then the mucosa is stripped down, and the bladder stripped up and off a short distance, so that a volsella can be used to grasp the cervix; he now opens the cul de sac of Douglas, and with the index finger of the hand required introduced into the opening, guides the needle used to suture the base of the broad ligaments. After placing a ligature the included tissue is cut, but before ligating, he first attaches the peritoneum to the vaginal margin with a continuous catgut suture. As soon as the base of the broad ligaments have been ligated and cut the remaining part of the still adherent bladder is detached, and the peritoneum is also attached to the vaginal margin anteriorly. The remaining part of the broad ligament is now ligatured and cut, going from one side to the other. From the beginning of the ligation of the parametria the needle is introduced near the margin of the vagina, then including as much of the parametria as he deems safe for one ligature, the needle is made to emerge again in the vaginal margin and the ligature tied; thus he brings the broad ligament stumps intravaginal. In cancer of the body of the uterus he removes the ovaries invariably, on account of the danger of malignant disease also being present or developing in them; but in cancer of the portio or cervix he leaves them, unless the appendages are diseased, or unless the patient has already passed the menopause, because in his experience

he finds that the sudden bringing about of the menopause causes very annoying symptoms in many cases, which can be avoided if the ovaries are left, they sustaining their physiological function. After he has removed the uterus, which he does under almost constant irrigation by means of a speculum especially constructed for such work, the stumps of the broad ligament on one side are drawn upon with a pair of bullet forceps, to allow him a clear view, and sufficiently to bring them absolutely intra-vaginal; then a full curved needle is again introduced through the stumps of the broad ligament, entering anteriorly through the vagino-peritoneal margin, and emerging posteriorly in the same manner; then the ligature is tied. On the other side the same steps are taken. Now the pelvic cavity is irrigated with warm water, no antiseptic solutions being used for the patient after the operation has once been begun. The rent still left communicating with the peritoneal cavity is now also closed, with a few catgut sutures. To give additional security another suture is passed through the broad ligament stumps, from one to the other, and tied. The vagina is now irrigated with Thiersch's solution and loosely packed with a strip of iodoform gauze. The advantages claimed by Dr. Boldt, from such complete closure of the peritoneal cavity, and from that method of operating is, that the patients make an unusually rapid recovery; he has discharged some within ten days from the hospital.

He condemns the use of silk as ligature material in severe terms; having consistently used catgut for several years, he from experience knows it to be, if prepared according to his method, just as antiseptic as it is possible for silk to be. It is just as safe for tying if properly tied, and the ligatures do not delay convalescence which is the case with silk.

Clamps are used by him when the parametria are thickened as the result of old inflammatory processes so that the uterus can not be drawn down so that ligatures can be applied. It is claimed that the uterus can be removed per vaginam with clamps, when it would be impossible to do it with ligatures. Clamps save much time, and his direct results are equally good as with ligatures, despite the various arguments used against pressure forceps, yet he considers it more ideal

to have a completely closed wound; hence he now uses forceps only when necessary.

Numerous cases of independent cancerous nodules in the body of the uterus, where the organ was removed for cancer of the portio or cervix, are cited, by which he desires to prove his stand, that partial operations are unjustifiable. Supra vaginal amputation would be a justifiable operation only when the clinical diagnosis of cancer of the portio or lower part of the cervix *only* could be established; but this cannot be done. He shows among other uteri, a uterus which he recently removed, illustrating the perfectly independent positions of the malignant disease; the portio cancer was developed in the line of a cervical laceration. The direct results of this operation are good in the hands of the experienced surgeon; his own direct mortality in forty-four vaginal hysterectomies done for cancer, is 6.8 per cent.

The operation is not sanctioned unless it can be presumably done so that no carcinomatous nodules or infiltrations are left. A woman who had her uterus removed for cancer, merely because it was a surgical possibility in the hands of the operator, will not live as long, nor be any more comfortable, than if the patient had only been treated on general sound surgical principles.

The operation is not contra-indicated because a uterus is immovable or the parametria are infiltrated, unless the infiltration is carcinomatous. For the purpose of determining the extent of the disease, and the character of the thickening, the patient must be put under full narcosis and a careful bimanual examination made; not the vagino-abdominal alone, because the extent of thickening in the broad ligaments and its character cannot be satisfactorily made out thus, but with one or two fingers in the rectum much more can be learned. If the thickening is possessed of elasticity, it speaks for its inflammatory character; carcinomatous infiltrations have a peculiar bulky feeling and resistance. The ability of making a correct diagnosis depends on the experience of the respective operator-one having extensive experience in pelvic massage according to Brandt's method usually has the advantage. The use of the curette at the time of operation will also aid materially to show how far the disease has extended, whether the parametrial infiltrations are inflammatory or carcinomatous.

To guard against recurrences, particular stress is laid on the necessity to keep sufficiently far away from the diseased cervix or portio. He in some recent cases of portio cancer kept from one and one-half to two inches from the apparent disease.

Many cases are called recurrences which in reality are only cases of continuing disease, due to some particles of carcinomatous structure having been left behind, the forceps tearing through the tissues while attempting to pull the uterus down; hence it may easily be overlooked, unless the operator is constantly on his guard. Infection during operation is one cause of recurrence; it is differentiated from continuing disease that the manifestations are more general, the disease taking in a larger area in the parametria, whereas in continuous disease the manifestations are local and spread gradually. The author has fifty per cent. of cases without recurrence operated more than five years ago; out of four cases done four years and four done three years ago, seventy-five per cent. of each class are without recurrence. Of those operated on two years ago, 55.5 per cent. are without recurrence.

The rate of mortality from cancer of the uterus, which is, according to his gathered statistics, now 5.5 per cent., can only be diminished by co-operation with the family physician, where also the remote results, after operations, will be much more favorable. The diagnosis must be made very early to accomplish this, for which purpose the aid of the microscopist must be called. Microscopical appearances must not be relied upon. All patients who present any suspicious symptoms should be carefully examined, and if the family physician is not certain of the diagnosis, he should send the patient to a specialist for advice.

The stand is taken by the author that there is no upper or lower line of limitation for this operation, but the moment that the diagnosis of cancer is made beyond a particle of doubt, based upon anatomical changes, the entire uterus must be removed, no matter how limited the disease seems or is, because, he says, "what conceivable reason can be given why a partial operation in a case of carcinomatous disease of the portio, guards more against a recurrence of the disease than the complete extirpation of the organ?"

INDEX OF SURGICAL PROGRESS.

VASCULAR SYSTEM.

I. Case of Common Carotid Aneurism Cured by Ligature. By G. R. TURNER (Greenwich). A man, æt. twenty-nine, suffered from a rather rapidly growing tumor on the right side of the neck, causing cough, some difficulty in breathing and very severe shooting pains on the right side of the head and face. On admission to hospital, it was found to be about the size of a clenched fist, extending from the angle of the jaw down to within an inch and a half of the clavicle and pushing the larynx about three-quarters of an inch to the left of the median line. It presented a well-marked expansive pulsation and thrill, with a loud and harsh systolic bruit. The diagnosis of carotid aneurism, probably from its rapid growth traumatic in origin was readily made. An incision was made in the usual direction, but reaching down to the sterno-clavicular joint. The internal jugular vein presented lying directly in front and to the inner side of the common carotid artery, which lay very deep. The needle was passed from within outward and the vessel tied with a No. 6 catgut ligature. Pulsation and bruit in the tumor ceased at once, as did the pulse in the right facial and temporal arteries. The pains in the head and face relieved and no cerebral or pulmonary complications ensued. The tumor remained stationary in size for more than three weeks, when, without obvious cause, it began to shrink and harden perceptibly and rapidly until a month later only slight hardness could be felt and no swelling was perceptible. The larynx returned to the middle of the neck and the cough, dyspnæa and pain disappeared.-London Lancet, June 25, 1892.

JAMES E. PILCHER (U. S. Army).

HEAD AND NECK.

I. A Case of Cerebral Exploration. By Dr. C. Sick (of Hamburg). This was the case of a young woman who had endocarditis and who developed a complete paralysis of the left arm and leg, no anæsthesia, no muscular spasm. The patellar reflexes were more marked on the left than on the right side and there was facial paralysis also on the left side. The tongue being rolled out of the mouth with a wave-like motion and decidedly deflected to the left. Pupils were dilated and reacted indifferently to light. The muscles of the eye were apparently not affected. Intense right-sided headache and convulsive motions of the left side of the upper lip when speak-Face flushed, tongue coated. It was impossible to determine whether the patient had a tumor or an abscess, but there being evidently a localized focus of disease in the upper part of the right ascending frontal convolution she was trephined. At the point of greatest pain about 16 cm. above and somewhat in front of the point of the mastoid process a flap of about 6 cm. in diameter was made. The incision was made so that the base of the flap pointed downward. A piece of bone of the size of a five-mark piece was then chiseled away, carrying the periosteum with it. This was preserved in a warm salt solution. The skull was very thick and hard, and the dura was opaque, sunken, and pulsating in the anterior portion of the wound. The dura was opened by a crucial incision and a marked cedema of the pia-mater was observed. The central groove ran about through the center of the wound. In the frontal convolution at the suspected point a sunken softened focus of yellowish color and about the size of a mark piece was discovered. The pia was split up and the softened tissue was punctured with a syringe, but only yellowish fluid was obtained. The wound was washed out with salicylic-water, the button of bone was placed in position and the wound sutured with catgut. One angle was left open for drainage.

During the following days there was frequent vomiting, headache and convulsions in the pectoral muscles and the face, but ten days later only a slight convulsion and no headache was noticed. The wound healed by primary intention. About six months later the patient was reported as looking well, free from facial paresis, left arm slightly movable at the shoulder and elbow and control over some of the fingers, but the arm still continued useless. The left leg still drags in walking. In this case operation was considered justifiable because of the intense localized pain and symptoms, by the increasing frequency and intensity of the convulsions, the deep psychical depression and anxiety of the patient and the uselessness of all treatment that had been tried. The success of the operation was not complete, but the headache was completely overcome and the convulsions were reduced in frequency and severity.—Jahrbücher der Hambürgischen Staats-Krankenanstalten, 1890.

SAMUEL LLOYD (New York).

II. Open Bony Cavities Lined with Epithelium Resulting from Trephining of Mastoid Process. By Dr. E. HOFF-MANN. H. argues that the extensive communication existing between bony cavities resulting from operation and the middle ear or the external auditory meatus and which are lined with epithelium results from the epithelium proliferating from the interior of the ear to the operation wound, in this way uniting finally with the external skin. Thus deep bony cavities arise which favor processes of decomposition, inasmuch as in most instances small ulcerative conditions are present, and dust and thrown-off epithelium collect. In order to avoid such cavities the operator must take care not to connect the wound in the osseous tissue with the middle ear and the auditory meatus, nor to enlarge existing communications. H. urges that this warning is to be heeded if, from any reason, a connection between the outer and the middle ear is to be produced other than that through the auditory meatus. - Deutsch. Med. Wochenschr., 1892, No. 46.

GEO. RYERSON FOWLER (Brooklyn).

III. A Review of the Operative Treatment of Thirtyone cases of Cleft-Palate. By Dr. A. Predohl (Hamburg). Von
Langenbeck's method of detaching and transplanting the muco-periosteal covering of the palate was used, the silk sutures being applied
by means of Langenbeck's and Brun's needles. The combined chloro-

form, morphine narcosis is employed. The morphine being injected subcutaneously one-half to three-quarters of an hour before the anæsthetic is employed.

The patient sits upright on the table with the head bent backwards. The hemorrhage which is only troublesome while paring the edges of the fissures and when the lateral incisions are made is readily controlled by irrigation of the palate vault with ice water. The advantage of the mixed narcosis is that the patients expectorate readily. No children are operated upon before their fifth year. The after treatment consists in rest in bed, absolute quiet and silence during the first days, in the administration of but little though nutritious and fluid flood and in frequent washings of the mouth with a weak potassium solution. The sutures are removed on the fifth to the tenth day. In nearly all the cases the wounds healed by primary intention.

If gangrene occurs it usually develops along the middle of the narrow flap. The whole fissure was usually closed at a single sitting even when cauterization of the nose and improvement in the form of the nose and lips had also been undertaken. The patients are then carefully trained in articulation by teachers who are accustomed to the instruction of the deaf and dumb.

The histories of the thirty-one cases conclude the article.—Jahrbücher der Hambürgischen Staats-Krankenanstalten, 1890.

SAMUEL LLOYD (New York).

IV. A Contribution to the Operative Treatment of Goitre.

By Dr. F. Bally (Basle, Switzerland). The writer has submitted to examination the cases of benign goitre, which came to operation at the Surgical Clinic in Basle, as well as those operated on in the private hospital of Professor Socin, in that city, from January 1887 to September, 1890. Especial attention was given to the intraglandular enucleations, in order to present a contribution to the often discussed question of the value of this method. Seventy-seven cases were observed in all, of which sixty were seen by the writer. The conclusions of the writer are in short, as follows:

1. Intraglandular enucleation of single or even multiple strumous nodes, if not too numerous, is in the majority of cases feasible.

From this method of operation are to be excluded: malignant strumata, diffuse hypertrophies of the thyroid of a parenchymatous or colloid character, as well as vascular struma in Basedow's disease, and, finally strumata with numerous disseminated nodes.

- 2. The layer between the capsule of the gland and the node is, in general, easily found.
- 3. The hemorrhage following extirpation from the capsule of the node, either at the time of the operation or following, is not dangerous to life, as a rule. In those rare cases where it becomes dangerous the operative procedure may be changed, and after ligaturing the thyroid arteries, partial extirpation may be done.
- 4. Injury to nerve fibres and subsequent paralyses of the vocal cords can always be avoided in intraglandular enucleation.
- 5. With regard to recurrence of tumors in the remaining portions of the glandular tissue still intact this method presents the same liability as the others.
- 6. Such sequelæ of the operations as tetany or symptoms of actual cachexia have never been observed by the writer.
- 7. Disappearance of the remainder of the goitre after partial extirpation, was not observed to follow, in twelve cases thus treated.

 —Beitraege zur klinischen Chirurgie, Bd. 7, Hft. 3, p. 509.

FRANK H. PRITCHARD (Norwalk).

ABDOMEN.

I. Gastro-enterostomy by means of Turnip-plates. By Dr. R. v. Baracy (Lunberg). Clinical experience proves that the mortality in gastro-enterostomy since the general introduction of Senn's method has decreased from 47 per cent. to 24 per cent.

B.'s experiments on animals have shown that the raw cabbage-turnip (Brassica Napurs variet. rapifera) supplies an excellent material out of which plates can be cut in a few minutes. Having used such plates in a patient with success, he reports his experience as follows:—

Patient 60 years old; has complained of gastric troubles for eight months; nausea, coffee-ground vomiting (usually half hour after meals),

constipation, etc. Patient noticed a tumor in the umbilical region. Fæces dark-colored.

Examination revealed the following conditions: Anæmia, sallow complexion, good general physical structure, but poor nutrition. Abdomen shrunken, gastric region somewhat swollen. In umbilical region a tumor noticeable when in a recumbent position. Palpation reveals a goose-egg sized tumor, having a humpy surface, hard as cartilage, but movable in all directions, lying parallel to the gastric axis-Inguinal, supraclavicular, and mesenterial glands not enlarged.

Abdominal Section: incision 12 cm. long, in the linea alba, beginning a few cm. above the umbilicus and terminating about three fingers' breadth below it. The hand in the abdominal cavity ascertained that the tumor, although movable, not only occupied the pyloric region, but also extended along a considerable part of the posterior gastric wall. The tumor was very hard and of the size of a goose-egg. Considering its dimensions and the great debility of the patient, gastro-enterostomy appeared indicated and was resorted to.

The great omentum and the relatively narrow colon transversum were raised; the mesocolon transversum was distended; the plica duodeno-jejunalis and the duodenum were identified; a loop lying about 50 cm. lower down was selected for anastomosis with the stomach.

A slightly vascular point on the anterior gastric wall was selected and incised (between the fingers of assistants) 5 cm. from the noticeable borders of the new formation. A bleeding vessel in the stomach wound was ligated and a large turnip-plate (which was about 3 cm. long) was introduced into the wound. The dimensions of the plate were: thickness, 0.5 cm.; length, 7.5 cm.; width, 3.5 cm.; central opening, 3 cm. long and ¾ cm. wide. The stomach wound was, therefore, somewhat shorter than the breadth of the plate, but the latter could be easily shoved through it by compression. The gastric mucous membrane was then united to the serosa by a continuous catgut suture. The jejunum was then incised longitudinally to the length of about 3 cm. A second plate corresponding to the first was introduced into the interior and fitted in position. Having scarified the gastric and intestinal serosa by means of the scalpel, a continuous suture united the serosæ along the

inferior contiguous rims of the plates. The plates were then brought into contact and the inner plate-fixing sutures were first united, then both terminal sutures, and finally the outer attachment-sutures. Whilst knotting the last pair of sutures the serous borders were pushed inside by means of a sound. The ends of all the plate-sutures were cut off short and shoved between the serous surfaces. A continuous suture was then applied along the anterior edges of the plates, so that the serous surfaces were in close apposition. After a thorough cleansing of the point of anastomosis it was replaced and the abdominal wound sutured. The whole operation lasted hardly three-quarters of an hour.

Temperature never above 37.5°. Vomiting ceased altogether. First stool two days after operation. Nourishment liquid, then semiliquid, and finally regular diet.

The deep sutures were removed on fifth day, the superficial ones on the twelfth.

On the fifth day there were found a few fragments of not wholly digested turnip in a semi-liquid stool. A larger piece of an undigested plate was found on the sixth day. The fragments were quite soft and similar to cooked carrots.

The turnip appeared to B. to be the best substitute for Senn's plates of decalcified bones. It excels all other substitutes. It is shaped like Senn's plate. The turnip-plates approximate large areas of serous surface; they are correspondingly hard so that the sutures do not tear; they do not change their volume in the intestinal tract and can, therefore, cause no pressure-gangrene. The chief advantage of the turnip-plates is the rapidity of their preparation.—Centralbl. f. Chir., July 9.

SAMUEL LLOYD (New York).

II. Operation by Short Circuit for Intestinal Obstruction. By Edward Atkinson (Leeds). To meet the necessities of these cases of intestinal obstruction, where, after careful exploration the cause is either undiscovered or out of reach, the author approves the exclusion of the affected portion of the bowel by the formation of a communication between the large intestine and a portion of the gut above the obstruction. This operation was successfully performed in the case of a man, æt. 22, who presented clearly marked symptoms of

obstruction of the bowels. On making the abdominal incision, distended coils of small intestine presented themselves at the wound; they were united together and to the iliac fossa by broad bands of adhesions, not recent, which matted the bowels together so completely as to prevent examination even after division of the bands. ordinary solution of the problem now presented would have been the construction of an artificial anus, but at the suggestion of Mr. Littlewood, the author determined to try the expedient of short circuiting. Accordingly the collapsed colon was opened as high as possible and a Senn's bone plate inserted; after isolating the nearest coil of ileum and securing it by tieing a piece of india-rubber tubing around it, the corresponding plate was inserted into it. The large and small gut, now being brought into apposition, were further secured by marginal sutures around the plates, and the peritoneal wound was closed. The operation lasted an hour and a quarter and the patient rallied excellently. Within twelve hours he had two large liquid operations and his further recovery was uninterrupted and characterized by no loss of digestive or absorptive function.-London Lancet, May 7, 1892.

JAMES E. PILCHER (U. S. Army).

III. Experience in the Operative Treatment of Perityphlitis with Especial Reference to the Operation at two Sittings. By Dr. Edward Sonnenburg (Berlin). This contribution is based on twenty-two operated cases, and refers only to the operative management of the circumscribed suppurative form of perityphlitis. If this latter can be diagnosticated it is clear that removal of the pus by any operation is better than non-interference. But a separation of the cases according to their nature and pathology is necessary. His studies in this direction are based on not only his own material, but also that of Guttmann's service at the Moabit Hospital. In general he distinguishes two groups—typhlitis and perityphlitis. He sums up as follows:

r. "We must seek by every means to distinguish clinically the simple inflammatory from the suppurative forms of perityphlitis. The sero-fibrinous exudations about cocum and colon, usually resulting from coprostasis, no matter how extensive, usually in previously healthy

persons become absorbed and need no surgical measures. General peritonitis does not follow. Its course is more protracted. Only in patients suffering from tuberculosis or from acute or chronic intestinal diseases can perforation and suppuration occur.

- 2. "Suppurative perityphlitis, usually starting from the appendix, is not or but partially resorbable. It is decidedly an object for surgical treatment and must be operated. Colic-like attacks with pain in the ileo-cœcal region, have usually preceded in longer or shorter intervals. The definable exudation, always small at first, is of a purulent character, because of gangrene or perforation of the vermiform. The symptoms of the attack are usually very precipitate. Experienced and observing physicians can by careful regard to all the symptoms mentioned recognize this form as suppurative perityphlitis (although not in all cases).
- 3. "The more superficial a perityphlitic exudation, recognized to be purulent, the sooner should it be opened, i. e., in the early days following first violent symptoms, whether threatening symptoms are present or not. In consequence of adhesions the operation is simplified. If we delay until the abscess has enlarged or is about to rupture, general sepsis will often be present and no longer controllable by incision.
- 4. "On the contrary the smaller, less distinct and deeper the exudation from the beginning, the more should one in the early day of the trouble begin with the two-act operation, especially if from increasing meteorism the resistance and dullness appear to entirely vanish. Experience has shown that by this method it is possible within a few days to again find the pus-focus and then to open it without injuring the peritoneum.
- 5. "Since in this way the operative procedure brings the patient no danger, it will be more readily possible in even doubtful cases to decide for operative treatment, and thus make the treatment more rational. The so-called spontaneous cures of doubtful termination, the frequent relapses darkening prognosis, and which starting from apparently harmless processes, often end fatally, are best avoided by the surgical procedure mentioned. For it must not be forgotten that suppurative perityphlitis is a dangerous disease that should be fought

and treated from the start with a definite purpose and by all the aid of modern science."—Sammlung klin. Vorträge, No. 13, 1891.

WILLIAM BROWNING (Brooklyn).

IV. A case of Internal Incarcerated Hernia, Laparotomy, Recovery. By LEONHARD SAHLIN (Upsala, Sweden). A male, 42 years of age, for four preceding days had suffered from at first mild then violent symptoms of incarceration. Washing out the stomach and intestine, together with opium and morphine seemed to relieve them at first. The abdomen was not swollen and insensitive to pressure except a few centimetres to the left of the middle line, immediately above the horizontal ramus of the pubic bone, but here a pronounced and distinctly outlined resistance was to be made out which gave on percussion a duller sound. This had been noticed even before he was admitted to the bospital but it had increased. Fecal vomiting set in, the pulse was small and rapid, but regular. The patient had also a double, movable inguinal hernia. An incision was made over the resistant point. The intestines were separated with ease. The constricted portion was made out distinctly, it measuring about 20 cm. It was at once replaced. The hernial sac seemed to be formed of a reduplication of the parietal peritoneum. It was entirely within the pelvis and extended from the upper border of the left obturator foramen downwards and backwards. Its walls were accessible to the finger from all points. The opening, which scarcely admitted a finger, was dilated with the finger and the abdomen sutured without drainage. The further course of the case was good, excepting the appearance of a hypostatic pneumonia on the fourth day. The writer ends with a few observations on the treatment of wounds, and expresses the opinion that since we have learned to sterilize by means of boiling even the country practitioner can now operate without danger of sepsis. He advises the boiling to be done in several small vessels, in order that the instruments may remain in the same vessels for use during the operation.—Upsala Laekerefoerenings Foer Handlingar, bd. 26, s. 325.

FRANK H. PRITCHARD (Norwalk, Ohio).

V. Radical Treatment of Congenital Inguinal Hernia in Females. By Dr. Lucas Championniere (Paris). The palliative treatment by means of trusses is becoming somewhat restricted. Increased frequency of operating has extended our knowledge of the pathological anatomy of the less frequent kinds of hernia, and our views concerning the stative frequency of the same are changed. Thus congenital inguinal hernia in females appears to be by far more frequent than was heretofore generally supposed. Among 14 radically operated inguinal hernia in women L. Ch. found in ten instances conditions pointing to a congenital origin of the disease. Among the symptoms to be so interpreted in this connection L.Ch. mentions the existence of the round ligament in the wall of a hernial sac which is hollowed out as by a furrow; the solid attachment of the serous covering, with this ligament; the occurrence of small cysts on the base of the hernial sac.

In the radical operation the author recommends that the incision be made as high as possible in order to remove the latter as great a distance from the vulva as possible. The operator invades the inguinal canal, seeks the hernial sac from above downward, rather than vice versa. The serous cover of the round ligament is so intimately adherent to the sac that the removal of the sac, without taking along the ligament is impossible. Therefore he separates as a rule, the ligament, together with the sac as high up as possible and after ligating, removes it. He found no disadvantages arising from this resection of round ligament, the stump of resection again attaching itself to the abdominal wall. Author recommends, after separating the hernial sac and before tying of the same, examination of the uterine annexa through the incision; if found to be diseased, these are to be extirpated at once. L. Ch. believes this examination to be necessary, as these organs, in case of inguinal herniæ, are frequently dislocated to the affected side and are often diseased. Author provides against recurrences by splitting, in every instance, the inguinal canal in its whole length, separating and removing the peritoneum as high up as possible and then uniting solidly and accurately the extensive denuded surfaces with each other by means of numerous deep sutures. A truss is but rarely prescribed.

L. Ch.'s results are very favorable, the operation in each instance was invariably followed by recovery. A number of patients examined afterwards were found to be free from recurrence; in the majority of the cases operated upon the time which has elapsed since the operation is too short to base a conclusion upon.—Bull. et mem. de la soc. de Chir. de Paris, xvii. p. 388.

GEORGE RYERSON FOWLER (Brooklyn).

VI. Excision of Cancer of the Rectum. By Dr. A. J. McCosh (New York). The author reports five cases in which four inches, three inches, six inches, ten inches and seven inches respectively, of the rectum were removed for carcinoma. The patients all survived the operation. In three of the cases the peritoneal cavity was freely opened. In one case there was subsequently speedy development of carcinoma of the liver resulting in death nine months after the operation. In the remaining four cases the patients remained in good health up to the time when last seen, being respectively twentytwo, three, nine and seven months after operation. The author's plan of procedure is as follows: A vertical incision is made in the median line from the posterior border of the anus backward as far as the tip of the coccyx, and, if necessary, extended upward as far as the middle of the sacrum. If the lower part of the rectum is healthy and does not need removal, this incision is deepened until the posterior part of the rectum is exposed. The gut is then divided across below the disease, leaving its lower segment attached to the anus. If this segment is not more than an inch or two in length it is better to divide it with the sphincter muscles vertically through its posterior wall. In other words, prolong the original incision through the posterior border of the anus. If the lower part of the rectum is diseased and needs removal, it is left unopened and two semicircular incisions are carried around it, meeting on the perinæum in front of the anal opening. In either case a ligature is tied around the lower end of the rectum to prevent escape of fœcal matter and to be of assistance in handling the gut.

If the incision to the tip of the coccyx does not give sufficient space, then the coccyx is removed, and, if necessary, the lower part

of the sacrum. The separation of the diseased rectum from neighboring tissues is then carried on until healthy gut is reached above the disease. This dissection should be mainly "blunt," and should be done by the fingers and blunt-ended scissors. If accomplished in this way, but few blood-vessels require to be clamped and still fewer ligatures to be applied. Sponge pressure, kept up for a few moments while the operator attacks another district, will generally be sufficient to control the greater part of the hemorrhage. This is preferable to the use of artery forceps, as not only is time saved-an importtant detail in these operations-but also the field of operanot be blocked by a dozen or more of artery clamps. It will sometimes be found useful to clamp a considerable amount of tissue in a large artery clamp and secure it either by a ligature en masse or by leaving on the clamp until the end of forty-eight hours. In an average case three to six vessels require to be secured, occasionally ten or a dozen.

When complete separation of the rectum as far as the upper limit of the cancer has been accomplished, the next step will depend upon the condition of its anal portion. If this lower segment must be removed, the entire gut is drawn down until the disease is beyond the margins of the external wound, and the rectum is then amputated at a point an inch above the upper limit of the cancer, and the cut end united by sutures to the edges of the external wound. If the lower part, with the anus and sphincter muscles, has been saved, the segment of rectum containing the cancer is resected, thus leaving a portion of healthy gut to which the lower end of the proximal portion is sutured. If the lower segment has been split, its edges can be sutured together immediately, or this may be postponed for a future operation. The external wound is then closed partially by suture, drainage being effected by tubes or iodoform gauze. If the peritoneal cavity has been freely opened, no attempt is made to close the opening by suture, but the wound below is packed with iodoform gauze.

If possible, the bowels are kept constipated for four or five days after the operation, and during this time the gauze packing is left undisturbed. After the bowels have been freely moved the gauze is taken out, the wound irrigated, and fresh gauze inserted. For several

days previous to the operation an attempt is made, by repeated doses of mild cathartics, to thoroughly empty the intestinal tract, and if this has been possible there will not generally be much difficulty in preventing a movement of the bowels for five or six days following the operation.—N. Y. Med. Journ., Sept. 3, 1892.

GENITO-URINARY ORGANS.

I. Cases of Extirpation of the Kidney. By Dr. M. SCHEDE (Hamburg). The reports of the cases are exhaustive and interesting, and include ten cases operated upon with a cure in every instance. Formerly he had operated seven times with six recoveries, making a total of seventeen cases and only one death. This is very different from the statistics of Gross (233 cases) with a death-rate of 44.6 per cent.; of Brodeur, of Paris (235 cases) 44.4 per cent., or of Czerny (72 cases) 44.4 per cent. Since the extirpation of kidney-tumors by means of the various retro-peritoneal incisions has been successful and the much more dangerous abdominal incision has become almost obsolete, we are certainly justified in looking for more favorable results of kidney extirpations.

Of the ten cases reported three were for carcinoma. The first, a woman of 45 years, had suffered for two years with pain, and had noticed about one year before a tumor in the left epigastric region. This tumor was of about the size of a child's head, movable, and inflation of the colon proved that that organ was in front of the neoplasm. Urine contained blood, pus, and numerous flakes and shreds of tissue which microscopical examination proved to be carcinomatous. On operation the tumor and some of the adjacent mesenteric glands were removed. Urine soon became clear and normal in quantity. The second a man, 59 years of age, had complained of urinary symptoms for upwards of fifteen months and a tumor in the right upper abdominal region. The tumor was movable, about 20 cm. long. Inflated colon settled the retroperitoneal position of the tumor. Firm capsular adhesions but no attachment to neighboring structures were made out at the operation. The vessels of the hilum were ligated with catgut. The remains of the kidney substance were made out as a narrow sharply defined zone resting on the tumor like a cap. The third and last case of malignant disease was a man 64 years of age, who had suffered for eight years from hemorrhages from, and pain in, the right kidney. At times the coagula were so large that obstruction occurred. Tumor first observed about one year before the operation, was about the size of a child's head, uneven, movable, rather sensitive to the touch, behind the intestine, easily distinguishable from the liver and moving on deep respiration. On operation a tumor having been removed another immediately presented in the wound. This was of about the size of a normal kidney and occupied the angle between the renal vein and the vena cava. A third and fourth tumor were also made out varying in size between a hen's egg and a walnut, and lying along the vena cava, and so surrounded by large veins that great caution was necessary in removing them. There was very little hemorrhage, owing to the careful use of hæmostatic forceps.

Urine cleared up within twenty-four hours and became normal in quantity by the third day. The kidney structure was almost completely misplaced by tumor masses.

The following case of uncontrollable renal hemorrhage is especially interesting. A man, 50 years of age, passed bloody urine for the first time after a cold drink. Had before frequently noticed a sensation of cold in the left lumbar region. If he remained quietly in bed the hemorrhages ceased, but returned as soon as he got up. Neither right nor left kidney could be made out and careful examination of the bladder by catheter and endoscope and bimanual examination under an anæsthetic gave a negative result. Considerable blood in the urine, however, but the microscope revealed nothing abnormal except blood corpuscles.

Styptics did not relieve the condition. The bladder was opened and elastic catheters inserted into both ureters. No urine escaped during the narcosis so a lithoclast was passed and seizing the ends of the catheters drew them out at the meatus; they were each inserted into a different vessel. The bladder wound was then carefully closed. The same evening the blood was seen to escape from the left kidney. On operation nothing abnormal could be found in

the kidney except that the kidney substance was very friable. It was removed and microscopical examination revealed an anæmic condition interspersed with small petechiæ, and decayed cylinders covered with red blood corpuscles.

Two of the cases were tuberculosis of the kidney.

The first, a man, 43 years of age, began to complain about two years before of intense pain in the right kidney, occasionally bloody urine and rapid emaciation. There was a slight swelling of the cervical and inguinal glands. Urine yellowish-red to greenish, containing albumen and blood. Palpation under anæsthesia reveals a slight enlargement of the right kidney. An enlarged horse-shoe kidney was removed with difficulty owing to the adhesions to the surrounding tissues. Two equally large renal arteries were encountered and the greatly dilated ureter was sewed to the skin. Section through the kidney showed it to be interspersed with a great number of miliary tubercles.

The second patient was also a man, 20 years of age, who began to emaciate and complain of burning pain in the urethra about six months before coming under observation. The urethral pain radiated to the right kidney. He had strangury, palpitation and anorexia. Right kidney enlarged and sensitive on pressure. Urinary examination revealed only numerous pus-corpuscles and bladder epithelia. No tubercle bacilli. Extirpation was simple, but the blood vessels were very short and their ligation required great care.

Miliary nodules plainly visible in the kidney substance. Pelvis of the kidney dilated and filled with flakey urine mixed with brownish masses. The ureter greatly dilated and its mucous membrane ulcerated. It was sewed to the skin. Patient gained thirteen pounds in five weeks following the operation.

Cases of pyonephrosis.

A woman, 45 years of age, giving all the symptoms of a pyonephrosis of the right kidney, was operated upon, and the kidney, surrounded by a thick, fat capsule, was easily removed. The ureter, which was thicker than a thumb was sewed to the skin. A catheter was passed into the ureter and the bladder as well as the ureter could be readily cleansed through the ureter fistula. Some days later, while the patient was lying in the dorsal position the urine from the left kidney was observed to pass from the bladder through the right ureter and finally nearly all the urine escaped through this channel instead of through the urethra. It was therefore necessary to close this fistula which was successfully done.

Woman, 24 years of age, suffered from pyonephrosis of the left kidney which was consequently removed. The degeneration was evidently caused by a very narrow stricture of the ureter which was only permeable to a very thin probe.

Woman, 26 years of age, had a uretero-vaginal fistula, closure of which was attempted unsuccessfully. A second attempt resulted in a catarrh of the bladder, ureter and kidney pelvis, so that it was finally necessary to remove the kidney in consequence of the inflammatory condition. A retro-peritoneal abscess followed and convalescence was slow.

Woman, 28 years of age, suffered from intermittent pyonephrosis and although there was no vital necessity for its removal the organ was removed upon the urgent request of the patient. The quantity of urine decreased during the first week, but became normal in the second.

The retro-peritoneal transverse section is in itself an almost harmless method.

In cases of exhaustive hemorrhage from the kidney nothing will avail except extirpation.—Jahrbücher der Hambürgischen Staats-Krankenanstalten.

SAMUEL LLOYD (New York).

II. The Histological Processes Which Take Place in the Healing of Renal Wounds and the Restoration of Renal Tissue. By Dr. A. Barth (Marburg). The speaker reported the results of his investigations in the Pathological Institute, at Marburg, Germany, under Prof. Marchand. The animals chosen were rabbits, guinea pigs and dogs. Large wedge-shaped pieces were excised from the kidneys, either in a horizontal direction or, generally, in the longitudinal direction of the organ, and the wound closed in the usual manner. In forty-eight hours such a wound will be found to be

closed, and its cavity filled with a blood coagula reaching into its finest crevices. Such a wound differs from an ordinary wound in that the parenchyma, in its vicinity undergoes grave nutritive disturbances, in consequence of the disturbance of circulation. The urinary canaliculi are most severely implicated. All the different variations from complete necrosis of entire canaliculi to the slightest alterations of the epithelium are to be observed. The cells swell up and melt into homogenous masses in the interior of the canaliculi, until there remains a necrotic mass of cylinder without the slightest indication of nuclei or the outline of epithelia. Fatty degeneration also plays a very important part in the process. The glomeruli, on the contrary, offer great resistance, which is apparently extreme. Side by side with these degenerative phenomena there are to be seen reparative efforts. The nuclei of the epithelia pass through various stages of division. These can be followed from the wound in decreasing frequency as far as the urinary canaliculi are injured. In the intact parenchyma they are not to be seen. The connective tissue elements of the altered renal parenchyma present very active stages of proliferation. In the endothelia of the intertubular capillaries and the interstices of the blood-vessels as well as in the fixed connective tissue-cells of the fibrous capsule numerous cells undergoing mitosis are observable which are of great importance for the actual formation of the cicatrix. It is expressly mentioned that those portions of the kidney which are far removed from the wound, as a rule, do not present any anatomic changes. The writer could also not confirm the assertion of Paoli, that the epithelium of the kidney remaining after nephrectomy underwent, as a rule, alterations. After two more days the changes described have made very characteristic progress. Even gaping wounds are now covered with a young granulating tissue, having its origin in the capsule and pushing its way into the coagulum of blood, while at the same time the coagulum is very vigorously attacked by a granulation tissue which has its point of departure from the intertubular spaces. The canaliculi of the vicinity are partly necrotic and thus remain a long time as necrotic cylinder masses in the cicatrix and its vicinity. The majority of them are filled with a young and regenerated epithelium. The diversity of karyokinetic figures at

this stage is very great, while, on the contrary, during the few following days they decrease in number. On the eighth to the eleventh day the real process of healing is generally at an end, the blood coagulum of the cavity of the wound being filled with an already firm granulation tissue. Following the stage of connective tissue proliferation follows that of contraction. The greater the resection the greater the contraction, which corresponds to the before described zone of circulatory disturbances. It is generally strongly contrasted with the surrounding renal tissue. The glomeruli are pressed closely together and the canaliculi are filled with young epithelium. Often this epithelial proliferation reaches into the cicatrix itself. But the cicatrix remains cicatrix and is never filled with the glandular structure again. Sometimes the contraction has the characteristics of diffuse process and affects, especially, the upper layers of the cortex, while the deeper ones, lying near the medullary portion undergo a compensatory dilatation and enlargement of the canaliculi and glomeruli. This diffuse contraction of tissues without doubt sets in in very extensive severing of the branches of the renal artery. The writer observed it only in very extensive and broad resection of the kidney in the longitudinal direction, when the majority of the renal vessels are implicated. Such incisions as are made at the post-mortems or in oblique resection of a pole are the most advantageous for the preservation of the organ's nutrition. If the pelvis of the kidney be opened after four weeks one finds under the cicatrix a granulation tissue, rich in cells and vessels, which is covered with epithelium, irregularly arranged in several layers. Here there had been produced an ulcer from separation of the two tissues which had been covered over by epithelium from the pelvis of the kidney. In one case, there was found thirty-two days after the operation, a fistula reaching from the pelvis of the kidney to the abdominal wound which had been coated with epithelium. Finally, it may be said that there is an undoubted tendency on the part of the tissues to regenerate and replace that which has been lost. The active proliferative process of the tubular epithelium, in the neighborhood of the wound, is of value, yields practical results, in that it leads to a restoration of the desquamated epithelium. On the contrary, the scanty formation of new canaliculi is of no importance and the glomeruli are certainly not reformed. There is no such thing as a recreation of new and active renal tissue. as asserted by Tuffier, Kuemmel and somewhat cautiously by Paoli, neither in the cicatrix, in its vicinity nor in any other portions of the remaining parenchyma of the kidney. The results which the writer obtained on five dogs are of extreme interest in this direction on this point, as bearing directly on this point. In one grown animal the lower pole of the organ was resected oblique, and in four young dogs of the same litter the kidney was resected in the longitudinal direction. Only one kidney was operated on and the animals killed on the eighteenth and hundred and second days. In none of these was there a complete restoration of the removed parenchyma by enlargement of the remaining portions of the kidney. A compensatory hypertrophy in the intact portions of the operated kidney is not to be denied, yet it is never more than that of the intact organ, so that the organ operated upon always remains smaller than the other. The compensatory hypertrophy takes place in the resected as well as in the intact kidney, being especially noticeable in the cortical substance, by an increase in size of all its elements. The glomeruli enlarge, their capsules dilate and the canaliculi grow in circumference and also probably in length. From this the glomeruli appear to be correspondingly further removed from each other. The writer demonstrated these conditions by means of four charts of microphotographic plates, derived from the four dogs of the same litter. The writer tried to investigate the question of the new formation of glomeruli. He examined all suspicious specimensas those which, for example, Tuffier regards as the initial stage of the glomeruli-in serial sections, and is able to assert that, neither in the operated nor in the intact kidney does a formation after resection occur. He did meet with youth glomeruli undergoing formation in the kidney of young animals, but these structures were present in the resected piece as well as in the remaining portions of the kidney. They were never found in the full-grown animals. They certainly have no connection with any compensatory processes. The writer promises more on this subject in a more complete work. - Verhandl. Der Deutsch-Gesellsch. fuer Chirurgie, XXI Kongress, 1892.

III. A Case of Resection of the Ureter. By E. KUESTER (Marburg). The speaker presented a thirteen year old boy, who had been operated on by his predecessor, H. Braun, in 1890, a leftsided nephrotomy being done on account of hydronephrosis. After the operation scarcely a drop of urine passed through the normal passage as the right kidney was absent. A year after the patient appeared at the Marburg clinic in order to be freed from his troublesome affection. All the urine was still passed through the abdominal fistula. It was turbid and albuminous. An attempt to catheterize the ureter through the fistula failed and aggravated his condition for a long It was concluded to expose the ureter and seek the obstacle to the flow of urine. In June, 1891, an oblique incision was made in the flank down to the kidney and the peritoneum pushed forwards until the kidney was reached. As the ureter was still invisible the anterior surface of the kidney, which was dilated downwards in a sacciform manner, was exposed and this sac opened through an incision anteriorly of about 6 cm. length. On drawing the walls of the sac apart the ureter was to be seen, as a slight projection at the posterior portion of the sac, 4-5 cm. in length and running from above downwards, to end in a slit-shaped opening. A button-shaped knife was inserted into the slit and the canal divided from one end to the other. On introduction of a sound, at about 3 cm. from the termination of the slit an insurmountable obstacle was met with. The canal being stlll further divided a very narrow cicatricial stricture came into view, which was only passable for the finest bougie. The ureter was resected at the pelvis of the kidney and at the point below the stricture so that about 3 cm. of the canal were excised. The lower end of the ureter was so dilated and separated from its surroundings that it could be easily applied to the posterior wall of the pelvis of the kidney. At its anterior border it was slit up from above downwards for r cm., the edges spread apart and, after freshening up the posterior wall of the pelvis, it was fastened in place by means of a few catgut sutures. In this manner a sort of funnel was formed which would better receive the urine. After closing the wound in the pelvis by a few sutures the large lumbar wound was stuffed with aseptic mull and dressed, to be united after a few days by secondary sutures. Already a few hours

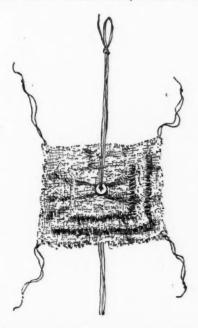
after the operation bloody urine was passed by the urethra and this continued regularly, although the greater portion of the renal secretion passed, as before, through the lumbar fistula. The average quantity of urine coming through the urethra, for months, was only 100 ccms. daily, at the same time being turbid and albuminous. By continued injections of a nitrate of silver solution the albumen was removed from the urine, but only after four months did larger quantities of urine pass through the bladder. In November the lumbar fistula was freshened up and closed by means of sutures, and in January the boy was discharged with entirely clear urine. He is at present healthy and in the best of spirits. An abdominal hernia has developed in the cicatrix and the urine again contains slight quantities of albumen. Kuester presents the case as a warning that we must be more conservative in our renal surgery, and, that especially in hydronephrosis nephrectomy must give way for the less dangerous operation, nephrotomy. This case also indicates the manner of treating those cases of hydronephrosis which are due to a stricture of the ureter. In the subsequent discussion, Trendelenburg stated that he had operated on a similar case but that the operation was followed by ileus and death. The necropsy revealed an adhesion between the sac and the Alsberg, of Hamburg, has observed a similar case.—Verhandl. der Deutschen Gesellsch. fuer Chirurgie, XXI. Kongress, 1892.

FRANK H. PRITCHARD, (Norwalk).

IV. The Control of Hemorrhage after Supra-pubic Prostatectomy. By Dr. E. L. Keyes (New York). The author acknowledges that a certain positive proportion of patients die within a few days after prostatectomy without suppression of urine, their demise being ascribed to shock, exhaustion, failure to rally, and the like. He thinks that the influence which hemorrhage may have, in determining these results is conjectural, while much loss of blood is often sustained. For the purpose of limiting the bleeding as much as possible he advises the use of a tampon, as follows:

The tampon is made of bichloride gauze. A square of four thicknesses of gauze is first cut, the length of each side being about six inches. Upon this are placed eight thicknesses of gauze cut square,

each side measuring four inches, and upon this eight other thicknesses of gauze, also square, the side measuring three inches. Centrally, upon the three-inch pad a small white shirt-button is tied by stout silk ligatures, transfixing the pad and tied upon the six-inch square surface. This central button also has a piece of silk attached to it, running out freely in the direction away from the three-inch surface. This is to facilitate extraction. Each of the corners of the six-inch pad is stoutly tied with a piece of silk, and the silk from each of these four corners is knotted at its end into a double knot, while the silk running out



backward from the button is tied with a single knot, for the purpose of distinguishing which is which when making the extraction; although practically it will be found that they must in one case all be made taut and pulled upon all together in order to effect removal with the greatest care and facility.

He passed a soft bulbous olivary French catheter through the urethra into the bladder and out through the supra-pubic wound, and tied the double silk upon the end of it, and with the silk making traction along the line of the urethra, drew the tampon powerfully down

into the funnel-shaped excavation of the prostate, and tied the double ligature over a piece of soft gauze at the urinary meatus upon the relaxed penis. In the second instance (because the patient also had deep urethral stricture) he made a perineal urethrotomy, and by direct traction through the perineal incision upon his tampon, drew it firmly into place, and tied the strings over a gauze perineal pad.

In both instances the subsequent removal of the pad was comparatively easy, and its effect in carrying out the function for which it was designed manifest and satisfactory.



Dr. A. T. Cabot has used with success for the same purpose a tampon consisting of a long strip of gauze, the edges of which should be rolled in and stitched so that there will be no loose, frayed edges, and then doubled in the way indicated in the cut and run on to the silk to which is attached the button. It could then have another thread attached to the upper end to remove it by. This could be drawn into the neck of the bladder as firmly, as any compress; but on loosening the thread which passes through the perineum and then drawing on the upper thread, it would come out in a long strip, much as the packing which one applies to a bleeding uterus does.—Medical Record, Sept. 17, 1892.

V. Guyon's Method of Evacuating Debris after Lithotrity. By REGINALD HARRISON, F. R. C. S. (London). The author remarks that a fragment of stone left behind after evacuation, being a nucleus for the formation of another concretion, is the most fertile of all the conditions favorable to the reproduction of stone. M. Guyon avoids this by not only breaking up the stone, but absolutely pulveri-In illustration, a urate-phosphate stone with a diameter, which only just brought it within the grasp of the largest lithotrite, was subjected to trituration for twenty-five minutes without withdrawal of the lithotrite. When no fragments could be felt with the lithotrite, the evacuating catheter was introduced, consisting of a full sized instrument with a larger eye on either side of the beak. No aspirator was attached to it for withdrawal of fragments, but after his bladder had been allowed to empty itself spontaneously by the catheter, an ordinary syringe was attached to the instrument and about six ounces of warm boracic lotion gently injected. Then the syringe was disconnected and the bladder allowed to empty itself, this process being continued until the contents of the syringe were returned absolutely pure. The bladder was finally washed out with a 1-1000 solution of nitrate of silver, and a rubber drainage catheter left in situ for twenty-four hours. The operation was completed in forty minutes, and considerably over an ounce of stone powder withdrawn suspended in the boracic lotion, the debris, after it had subsided, having the appearance and feel of soft homogeneous mud with no appreciable fragments of stone in it. The amount of blood was little more than sufficient to color the water and entirely disappeared before the syringing was completed. The author epitomizes the points observed in this and similar procedures, as follows:

- 1. The use of the lithotrite to produce the pulverization was necessarily more prolonged than where mere fragmentation is the object. This with the patient under an anæsthetic is a matter of no importance so long as the lithotrite is carefully used.
- 2. The less frequent introduction of lithotrites and evacuating catheters along the urethra. This is a point of some little importance where the prostate is large and the deep urethra irregular.

- 3. The back action of the suction apparatus by means of which fragments of stone often become impacted in the saccules and lacunæ which are found in bladders, complicated with enlarged and irregular prostates, is done away with. The force of a syringe is probably less than that of the back action of a strong rubber bag compressed by the hand. Further, impalpable wet powder is substituted for irregular fragments of stone. The latter by their nature are not only more liable to become impacted in depressions within the bladder wall, but by their movements under the force of the aspirator to wound the mucous membrane.
- 4. With the syringe, there is no chance of fragments once with-drawn being washed back by any return current into the bladder.—

 London Lancet, July 2, 1892.
- VI. Laparotomy for Rupture of the Bladder. By J. W. HULKE, F. R C. S. (London). A man, æt. 33, after having been butted in the abdomen, suffered great pain in the vicinity of the bladder. The catheter drew off six to eight ounces of urine very slightly tinged with blood. The next day twenty-four ounces were drawn off at noon, which seemed incompatible with the diagnosis of complete rupture of the bladder. Great abdominal pain and distension with turbid and offensive urine persisting, explorating laparotomy was undertaken, by an incision three inches long, just above the pubis, afterwards extended nearly to the umbilicus. A large extravasation of blood was found behind the rectus muscle in the subperitoneal cellular tissue. On opening the peritoneum, several ounces of greenish bloody fluid escaped. At first, only coils of highly congested small intestine, coated and agglutinated by recent exudation, were apparent, but on displacing these gently upward much highly offensive puriform fluid welled up from the situation of the urinary bladder, and when this had been sponged out, a rent nearly sagittal in direction, about two inches and a half long, in the posterior wall of the bladder, was brought into view. Its edges were swollen, soft and stained with infiltrated blood. The rent was closed with a double row of closely placed sutures, the deeper series including all the tissues down to the mucosa, and the superficial series, the peritoneum with perhaps a thin

plane of muscular tissue. The bladder was then injected with a boric solution and found watertight. The peritoneum was flushed, and the wound closed and dressed. The peritonitis persisted and the patient died the next morning.—London Lancet, July 23, 1892.

VII. Perineal Prostatectomy. By C. Mansell-Moullin, F. R. C. S. (London). The author presents two cases which illustrate the advantage and risk of this operation. (1) A man, æt. 70, complained of difficult micturition of about three weeks standing, although he admitted nightly interruptions for some time previously. Retention was now complete. A silver prostatic catheter passed easily, but a soft one was brought to an abrupt stop just beyond the bulb and could not be introduced without a stylet. The vesical capacity was twentyeight to thirty ounces and expulsive power was almost extinct. The amount of urine daily varied from thirty to sixty ounces, which could be withdrawn only by catheter. After a fortnight of this, the ease with which a full-sized catheter could be passed and the very small quantity of blood in the urine showing that the retention was not due to temporary congestion or thrombosis, rectal examination showing that the prostate was only moderately enlarged, and the obstruction to the passage of a soft catheter, indicating simply enlargement of the middle lobe of the prostate, a perineal section was undertaken with a view to the discovery and removal of the obstruction. Through a soft and lean perineum, with a prostatic urethra scarcely longer than normal, the median lobe was easily reached and found protruding forward into the neck, and was removed with the top of the left lateral lobe by means of a wire ecraseur. The conditions showed that these two projecting nodules, meeting over the urethral orifice when the vesical muscles were put in motion, effectually closed it. An incision was then made behind along the middle line of the floor of the urethra and the firm tissues torn through by the pressure of a steel director, with the object not only of removing the valve, but establishing a low level channel and keeping the post-prostatic pouch empty until its walls had recovered their tone. Suitable drainage was provided. There was little hemorrhage during the operation, but much venous oozing during the following night, to which in great measure was due the very severe shock. For some time great weakness prevailed complicated with delirium, during which the tube was withdrawn from the bladder, which was allowed to drain itself through the wound, controlling decomposition by occasional sublimate irrigation and injection of iodoform emulsion. Very little progress was thus made until the end of the third week, when rapid recovery set in, and, at the time of the report there seemed to be every prospect of a perfect result.

(2) The second case occurred in a man, æt. 66, who had not been able to pass urine without a catheter for nine years, now suffered from retention. His urine was alkaline and he presented the symptoms of incipient uraemia. The difficulty of passing a catheter continuing to increase, perineal section was determined upon. The urethra was laid open and the prostatic portion examined with the finger. The bladder, by passing in a sound and hooking it against the the trigone, could be drawn down sufficiently to feel the neck; the lateral lobes were found to be much thickened and elongated, having raised up between them a fold of mucous membrane—which proved to contain an up growth from the prostate-across and behind the vesical orifice. The median bar was divided but, as this did not give much relief, an attempt was made to enucleate a sufficient portion from the lateral lobes by incising the mucous membrane covering them, and working at them with the finger and a Volkmann's spoon; upwards of a dozen nodules, varying in size from a pea to a hazelnut, were shelled out in this way and the channel freely opened so that the finger could be introduced without difficulty and a drainage tube of full size fixed in the wound to carry off the urine. Collapse followed the operation, and the patient remained in a low condition, blood and pus came from the wound in considerable amount, and he died on the sixty-first day. The autopsy shown that the entire prostate had been scooped out, only a few sloughing shreds about the wall being left. The author remarks, in view of the autopsy, that the lateral lobes in this case were the offending structures, their upward growth having raised a fold between them and the vesical orifice, but it was firm and rigid, not valve-like, and though it might have led to the production of a post-prostate pouch,

would not of itself have caused complete retention; the chief difficulty, if not the whole, was due to the way in which the increase in their thickness had compressed the urethra into a narrow slit, through which it was not easy to force the finger. This, aided by a stricture from which the patient suffered, had created a degree of resistance which the wall of the bladder, weakened by long continued inflammation, was unable to overcome. Catheterism had become impracticable. The supra-pubic operation would almost certainly have proved fatal, and would not alone have relieved the stricture. Simple drainage would probably have been the best resort.—London Lancet, July 16, 1892.

VIII. Case of Simultaneous Epithelioma of the Lip and of the Penis. By G. R. TURNER (Greenwich). A man, æt. 24, with no family history of malignant disease and a negative result from syphilitic treatment presented himself with a harelip and a warty mass of four months growth on his lower lip. Both were operated upon, the latter being shown by microscopical examination to be distinctly epitheliomatous in character. He now confessed to a similar growth on the penis, dating back nearly a year, which had been treated ineffectually by caustics. The growth formed a sore, large and ragged, with hard and somewhat everted edges, chiefly on the dorsum and nearly surrounding the whole penis, extending from within half an inch of the root to the same distance from the tip. The growth was removed, involving a very considerable portion of the penile coverings, but neither the corpora cavernosa nor the corpus spongiosum were invaded. The patient made a good recovery. In concluding, the author adverts to the rarity of the development of epithelioma in two places so remote from one another as the lip and penis, particularly in so young a subject.—London Lancet, June 25, 1892.

JAMES E. PILCHER (U. S. Army).

IX. Operative Treatment of Hypospadias of the Scrotum. By Dr. A. Landerer (Leipsic). The method Landerer used twice successfully is an imitation of Rosenberger's operation in case of epispadias, where the penis is covered by means of the

abdominal skin. Landerer operates in two stages. At first the penis is sutured to the scrotum on both sides of the urethral passage in the penis, two strips from three to four millimeters broad are freshened, the freshening extending into the scrotum; the length of the freshening must amount to twice as much as the length of the urethra to be formed. Suturing the gland of course at the deepest point of scrotal freshening. The second part of the operation is performed after six or eight weeks. The penis is then to be taken out of the scrotum and to be covered with skin on its lower surface. For this purpose it is pulled high up at the glans and now two lateral incisions about four or five centimeters long are led from the urethral opening into the dartos. The rhomboid defect thus arising is closed by suturing. In this way a fair penis with clear upward tendency is made.—Deutsche Zeitschrift für Chirurgie. Vol. XXXII, p. 591.

X. Operation for Urethral Fistula. By Dr. Carl Lauenstein (Hamburg). Of late years Lauenstein repeatedly obtained excellent results by using the following method: As in case of Lawson Tait's "perineal plastic" method, the edge of the urethral fistula, by a horizontal incision in the plane of the fistula from four to six millimeters, is circularly separated into two plates without the removal of any tissue, the urethral wall forming one plate and the skin the other. The corresponding tissues are then united by catgut sutures. A small rubber tube is placed in the urethra for the passage of urine until the wound is healed. The healing seems favorably influenced by the breadth of the freshly denuded surfaces.—Deutsche Zeitschrift für Chirurgie. Vol. XXXII, p. 563.

GEORGE RYERSON FOWLER (Brooklyn).

TUMOR.

I. Deep-Seated Dermoid Cyst of the Thigh. By J. W. HULKE, F. R. C. S. (London). A woman, æt. 47, presented a tumor on the inner part of the right thigh, extending from the groin to one hand breadth from the knee, and having a transverse diameter equal to if not greater than that of the thigh itself. It fluctuated distinctly and

near its lower end presented a small ulceration from which oozed a turbid, milky, inodorous fluid. The equal distinctness of the percussion wave throughout the tumor showed it to be unilocular, and the fluid oozing from the ulceration showed its contents to be sebaceous in character. The absence of sebaceous glands in the groin excluded the diagnosis of wen and narrowed it down to dermoid cyst. The practicability of successful extirpation of the cyst appearing probable, it was undertaken, with a successful result. It was found to be intimately attached to the periosteum of the front of the os pubis, just under the attachment of the adductor longus; and at this point two little tufts of hair were found springing from the inner surface of the cyst. The wound was closed and dressed and ultimately healed satisfactorily, although complicated at first by several troublesome sinuses.—London Lancet, July 23, 1892.

JAMES E. PILCHER (U. S. Army).

BONES .- JOINTS .- ORTHOPÆDIC.

I. Cases of Ununited Fracture of the Humerus Subjected to Osteotomy and Metallic Suture Without Benefit. Reported by Dr. J. Hennequin (Paris). In an article on osteotomy of the long bones, the author discusses the indications and contra-indications for osseous sutures in cases of ununited fracture. He contends that, when the fragments are in contact, without interposition of foreign tissue, or when the interval separating them is slight, the suture is without influence in the formation of the osseous callus which will form, when the constitutional conditions of the patient are favorable, as well without as with the suture, but which will be wanting notwithstanding the refreshing and suture of the fragments, if the system is under the influence of one of those tendencies, the nature of which we are still ignorant of, which renders it powerless to effect a bony union.

As demonstrating the truth of this he recites the following cases, which may be considered as particularly valuable as instances of a class of experience which is rarely published.

Case I.—Male, aged sixty years; in apparently vigorous health. Simple fracture of the left humerus at a point a little above its middle. Service of M. Labbé, Hospital Beaujon. Retentive apparatus for forty-five days; when removed, no consolidation. After two weeks a new apparatus applied. At the end of four months no consolidation. Operation by M. Labbé. The fragments found with their ends in contact, no tissue interposed, and surrounded by a fibrous sheath. The end of the upper extremity was conical; that of the lower somewhat swollen and enlarged, with a corona of osteophytic bosses. Ends of fragments resected by a saw and united by two silver sutures. The further history of the wound was without complication and also without consolidation.

Five months later the procedure was repeated by M. Bouilly. Again no consolidation. Some months later M. Schwartz subjected him to a third operation, in which the bones were sawn obliquely and the surfaces fastened together with a bone peg. The wound suppurated; a fistula resulted; no union occurred, and finally the patient was discharged after a residence of eighteen months in the hospital, still having a false point of motion and a fistula.

Case II.—A very vigorous man, thirty years of age. Fracture of the left humerus at a point a little above the middle. Splints for three months, at the end of which time no consolidation. Operation at the Hospital Beaujon by M. Bazy; ends of fragments resected and united by two points of silver suture. Sometime later the patient having been unimproved by the first operation, he was again subjected to the same procedure by M. LeDentu, but with no better result, and was finally discharged with a false joint persisting.

Case III.—Male, forty-five years of age, somewhat anæmic, but without known constitutional vice. Fracture of the left humerus at its middle. At the end of three months no consolidation. Operation at the Hospital Bichat by M. Broca. Fragments when exposed presented same configuration as noted in Case I. Ends resected and united by iron wire. Two months later no consolidation. Patient left the hospital with his false joint, and was lost sight of.

Case IV.—Male, aged upwards of sixty years; fracture of right humerus at the point of union of middle and lower third; persistent pseudarthrosis; operation revealed abundant muscular fibres interpersed between fragments. These having been cleared away, the ends of the bones were resected and brought together accurately with two silver sutures, and dressed with plaster so as to hold the fragments very exactly in their normal relations to each other. Nevertheless no osseous union followed, and the false joint persisted until his death some months later.

The author also recites the following interesting case of non-union after fracture of the femur, persisting despite repeated operations: A man, forty years of age, in excellent health, sustained a fracture of the right femur just below the trochanters. At the end of four months there was no union, but much deformity and shortening. For four months more ordinary treatment was persisted in, but no improvement having been effected, the seat of fracture was exposed by incision, the ends of the fragments cut obliquely and placed in apposition, and dressed with an extending and immobilizing apparatus; but with suture of the bones.

Five months later no consolidation had taken place, and the surgeon, M. Berger, at the Hospital Lariboisiere, again exposed the ends of the fragments, refreshed them and mortised them into each other, securing them together with two strong sutures of platinum.

The second operation failed to effect consolidation equally with the first, and after some months of effort, all further attempts to secure union were abandoned.—Revue de Chirurgie, August, 1892.

II. Fracture of the Upper End of the Ulna, with Dislocation of the Head of the Radius. By K. M'LEOD, M. D., F. R. C. S. (Calcutta, India). In a clinical lecture at Calcutta Medical College, Prof. M'Leod used a case of this injury as a test, and, after citing numerous experiments, authorities and statistics, concluded: I. That the injury in question is by no means infrequent.

2. That it is generally due to direct violence, the point of application and degree of violence determining whether one or both of the injuries result.

3. That the deformity is characteristic, the upper

fragments of the ulna being pushed or pulled forward and outward, causing angularity of the shaft and some bulging at its upper end, and the head of the radius lying in front of the external condyle of the humerus and giving rise to some abnormal fulness there. 4. That the characteristic displacement of the upper fragment of the ulna is due to the effect of the violence, and to traction exercised by the oblique and orbicular ligaments and the supinator brevis muscle. 5. That when the displacement of the radius is not detected and remedied, the ulna undergoes union in its distorted state and the limb loses considerably in efficiency as regards both movement and power.

From these considerations the author strongly insists upon the following practical precepts:

- I. Whenever we find a fracture of the upper end of the ulna, examination should be very carefully made for a dislocation of the head of the radius.
- Should such a dislocation be found, it must be reduced at once and endeavors made at the same time to rectify the displacement of the upper ulnar fragment.
- 3. In view of the clinical fact that it is sometimes found very difficult to retain the head of the radius in position after reduction, examination of the part must be made from time to time in order to be sure that the head of the bone is in its proper place.—London Lancet, June 18, 1892.
- III. Spasmodic Wryneck. By Noble Smith, F. R. C. S. (London). Referring to two cases, previously reported, he remarked that the cure seemed to have been permanent. (1) In the first, the patient had suffered severe spasms for sixteen years; the author removed a piece of the left spinal accessory and subsequently of the posterior branches of the second, third and fourth cervical nerves, as well as every nerve filament that he could find entering the splenius capitis muscle. This patient had remained well for over two years. (2) The second case was that of a gentleman, æt. fifty-seven, who had suffered spasmodic movements of the neck, head and face, which had begun in the right sterno-mastoid. He was permanently cured by excision of a piece of the right spinal accessory.

- (3) He now reports a case of a woman, æt. forty-five, with spasmodic wry neck of fourteen years standing. In this case the external rotators on the right side were acting more strongly than the left sterno-mastoid, wherefore he decided to operate upon the posterior branches of the cervical nerves in the first instance; the operation could not be completed on this occasion because of the weakness of the patient. But six months later half an inch of the left spinal accessory was removed, which entirely relieved the spasm of the sterno-mastoid. By a third operation, pieces were removed from the second, third and fourth posterior branches of the right cervical nerves; this entirely relieved the spasm of the splenius, but some slight paroxysm still existed in the deep rotators, which, however, is gradually improving, so that a cure is anticipated.
- (4) Another woman, æt. over fifty, had suffered for fourteen years from severe spasms. Excision of a piece of the left spinal accessory had relieved the patient from spasm of that muscle and thereby removed the severe pain from which she was suffering. Other spasms at the back of the neck were also much relieved and, if not relieved in due time, can be prevented by a further operation.—London Lancet, June 18, 1892.
- IV. Spasmodic Wryneck. By A. Pearce Gould, F. R. C. S. (London). A woman, æt. twenty-eight, had suffered from spasmodic torticollis for eight years, the spasm being apparently limited to the sterno-mastoid muscle. The constant electric current having proven unavailing, the author exposed the spinal accessory nerve by means of an incision along the anterior border of the upper part of the sterno-mastoid muscle, intending to stretch it and excise a considerable portion. In stretching it from the central end, the nerve gradually gave way and a long slender nerve was pulled out from the jugular foramen and four and a half inches of it were excised. No special symptoms were observed attributable to the tearing of the nerve roots. The wound healed readily and an entire cure resulted.

The author has on two subsequent occasions removed the spinal accessory in the same way for spastic torticollis, but it is yet too early to pronounce with certainty upon the result of the operation in them.

—London Lancet, June 18, 1862.

V. Spasmodic Wryneck. By Edmund Owen, F. R. C. S. (London). A woman of mature age had been suffering from severe disfiguring spasmodic torticollis for three years. General and special medical treatment, with massage and electricity, having proven unsuccessful, the author made an incision about three inches long, descending from the apex of the left mastoid process along the anterior border of the sterno-mastoid; the external jugular vein having been tied in two places and divided, and the edge of the sterno-mastoid having been raised, the posterior belly of the digestric was exposed and close beneath it a greatly enlarged and livid lymphatic gland, which it was thought might be the source of the trouble on account of its pressure on the nerve, and it was excised. After a little more dissection, the spinal accessory was exposed and about an inch of it removed. The patient recovered well from the operation and the spasm was relieved.

The author remarks that the spinal accessory nerve enters the sterno-mastoid in so deep a situation that the muscle has to be well slackened and turned out before the nerve can be thoroughly exposed. A surgeon, therefore, who tried to reach it through a small incision might not improbably fail altogether to reach it; indeed, in the present case, a small artery, descending obliquely over the internal jugular vein to enter the muscle was at first taken for the nerve; but when pinched with the forceps, it did not cause contraction of the muscles, as happened later when the nerve itself was so treated. The spinal accessory nerve, moreover, is as exposed in the operation a very large and conspicuous trunk; it enters the substance of the muscle at about the level of the angle of the jaw, but above this level, it is deeply hidden beneath the muscle; when the muscle is well pulled outward, the nerve is tightly stretched and is thus readily made out.

The points to be borne in mind are: (1) As the nerve lies deeply beneath the muscle, a free incision must be made to find it; (2) that it is by no means near the anterior border of the muscle; (3) that it runs almost vertically and that it enters the deep aspect of the muscle at about the level of the angle of the jaw; (4) the incision should be begun at the tip of the mastoid process, and (5) the hinder border of the posterior belly of the digastric and the conspicuous internal jugu-

lar vein afford the best landmarks. This operation, though straightforward is by no means easy; it is far better than that of seeking the nerve as it emerges from the sterno-mastoid.—London Lancet, June 18, 1892.

VI. Spasmodic Wryneck. By J. APPLEYARD, F. R. C. S. (Bradford). A woman of mature years had suffered from spastic torticollis for nine months, during two of which she had been under treat ment by Dr. Major in the Bradford Infirmary, York. Under chloroform, the author turned the head on its side with the face to the left and made an incision for about three and a half inches from the right mastoid process downward along the anterior edge of the right sternomastoid muscle; the fascial sheath was opened, the anterior border of the muscle defined, and the tip of the right forefinger inserted near the mastoid process under the muscle and gradually but gently worked downward inside the sheath, each resisting vessel or collection of fibres drawn out with a blunt hook for inspection before division. At last the spinal accessory nerve was felt, after some delay and difficulty, firmly resisting the progress of the finger, but nearer to the posterior edge of the muscle than was expected, and entering the muscle about the level of the lower border of the angle of the jaw. It was hooked forward for inspection, found to be a little thicker than a crow quill, and certainly solid and made up of nerve bundles. A piece threequarters of an inch long was exsected; one small artery and one vein were ligatured; there was only slight loss of blood, and the wound healed readily. The condition was entirely relieved, but the affection recurred six months later on the other side. - London Lancet, June 18, 1892.

VII. Potts Disease of the Spine. By E. MURHEAD LITTLE, F. R. C. S. (London).—Abscess is not so common a complication of Potts disease as is generally supposed. Out of 187 cases treated as out-patients at the National Orthopædic Hospital only seven cases of abscess are recorded. Among the in-patients—many are admitted on account of the abscess—the proportions are greater (21 in 133 cases). Abscess frequently exists without any external evidence of its presence.

Spontaneous cure is the end of the majority of vertebral abscesses, if we include those that give no external evidence of their presence.

In a disease which tends so often to end in spontaneous recovery—he has had but six deaths from all causes in 133 admitted as inpatients—radical operative measures on a part so deeply seated as the anterior half (the vertebral bodies) of the spinal column can seldom be justifiable, and although since Israel's operation in 1882, Treves and others have operated on the seat of the bone lesion in a good many cases, the results are not such as to make the operation preferable to expectant treatment in most cases. Abscess is a serious complication in Pott's disease, and there are four methods of dealing with it. I. Expectant treatment; 2. Repeated aspiration; 3. Injection of fluid to promote absorption; 4. Incision.

Expectant or passive treatment should always be tried and persisted in as long as an abscess is not rapidly increasing or showing a disposition to point, and not a few chronic cases do well under this treatment.

Aspiration will only remove the serous or more fluid parts of the contents leaving the cheesey or curdy masses, but by reducing the tension it will put off the evil day of rupture.

With antiseptic precautions, simple incision, repeated if needed, is to be preferred to aspiration. Injection with iodoform glycerine or iodoform and ether appears certainly worthy of trial.

Paraplegia was only noted in ten out of the 133 cases, and paresis in 8. Of the former 7 recovered, while of the latter 6 are recorded as having recovered and one is not noted. The cause of the palsy is generally a pachymeningitis and not displacement of the vertebræ.

Laminectomy has been done for the relief of this condition some score of times with a fatal or negative result in many cases, the field of operation is a narrow one, applicable to otherwise hopeless cases.—

The London Lancet, July 23, 1892.

JAMES E. PILCHER (U. S. Army).

VIII. A Report on Thirty-seven Cases of Tuberculous Disease of the Hip-Joint; for which Excision was Performed in Thirty-six by BILTON POLLARD, M.D., and C. F. MARSHALL, M.D. The series of cases reported has to do with thirty-six patients

in one of whom both hips were excised making therefore thirty-seven operations for the removal of tuberculous disease from the hip-joint. Eight of the patients or 21.6 per. cent. are known to be dead. The mortality of the operation was 10.8 (four patients). Of the remaining four cases two died of intercurrent affections in no way connected with the tubercular trouble and the other two from other tubercular lesions. There are therefore twenty-nine cases to be considered but two of these could not be found, reducing the number to twenty-seven, seventeen of whom are healed and are going about without splints, the remaining ten are still wearing Thomas's splints. Four of these latter appear to be entirely well, six have a sinus.

The age of the patient at the onset of the disease varied from between one and two years to between nine and ten; the right hip was affected in nineteen cases, the left in sixteen and in two the side affected was not recorded. In ten cases the cause was said to be a fall or blow on the hip and in one the disease appeared while wearing a double Thomas splint for disease of the opposite side. The duration of the disease before operation was from three months to between five and six years. In twenty-nine cases the abscess was situated anteriorly to the great trochanter; in fifteen of these it was altogether in front, in fourteen it was partly anterior and partly to the outer side of the hip, in three cases it was behind the great trochanter. Two cases also had iliac abscess which communicated with the joint through the psoas bursa. Four cases had discharging sinuses before the operation. The sinus leading from the superficial abscess to the joint was usually found just above the neck of the femur. In one case the abscess passed directly backward to the joint through the Y. ligament. In thirty-five cases the head of the femur and the acetabulum were denuded of cartilage and the bone carious to a greater or less extent. In five cases the trochanter was also diseased; in one case only the acetabulum was affected, and in one the head of the femur was removed as a sequestrum. In the majority of the cases the anterior operation was done, posterior excision only being performed in four cases. Of the thirty-three anterior operations, two were really arthrectomies, (1) the one when the acetabulum only was deseased, (2) the one when the head of the femur was removed as a sequestrum. In three cases an abscess was opened and drained before the operation and in two others a partial arthrectomy was attempted first.

Five cases died before the wound healed. In twelve union was by primary intention, in six everything except the drain opening healed by primary intention. In the other fourteen the period of healing ranged from three to fifteen months.

In twenty-six of the thirty-two cases, 81 per. cent, there was recurrence, in twelve of these there was further bone disease. Secondary operations were required in twenty-six cases, but in fourteen this was very slight and caused little inconvenience.

All the cases, except those that died, were improved in general health by the operation and were relieved from pain.

Primary union, including cases in which the drainage fistula healed by granulation shortly after, the rest of the wound, occured in eleven out of the seventeen cases. Four had no secondary operations, remaining well. Four remained well for a year, three had recurrence. Two cases remained well for two years and one year and nine months before recurrence. In a total of twenty cases, recurrence of disease was observed in seventeen. In nine further bone disease was found, in the others the bones were not affected. In the seventeen complicated cases the shortening varied between one and two inches, in nine cases two inches, in five two and one-quarter inches, in one three inches, and in one case three and one-half inches. The average shortening was 1.85 inches. In the two cases having three inch shortening the trochanter was removed. The apparent shortening was, as a rule, less than the actual shortening, the difference being due to a slight abduction of the limb or to some compensatory curve of the spine. The average apparent shortening is 1.3 inches.

In two cases there was immobility of the joint, in four cases there was scarcely any mobility, but the other eleven cases were more or less freely movable. The effect of flushing is favorable to the primary healing of the wound, seven out of twelve cases when this method was employed having healed by the first intention while only eleven out of twenty-five healed primarily where it was not employed. Healing by first intention occurred in 71.4 per. cent of the cases where no drainage was employed, in 75 per. cent where it was employed for 24

to 48 hours, and in 53 per. cent where drainage was continued for a longer period.—The London Lancet, July 23rd and 30th and Aug. 6th.

SAMUEL LLOYD (New York).

GYNÆCOLOGICAL.

I. Pelvic Inflammation. By REGINALD H. FITZ, M. D. Pelvic inflammations affect the wall and contents, and inflammation of the former usually results from disease of the latter.

These inflammations are simple and infective. The former result from traumatic agencies, as a ruptured cyst, a twisted pedicle, a prolonged labor, or a tumor. The latter are septic, gonorrhoeal or tubercular. The sepsis results from bacterial invasion under conditions associated with pregnancy and menstruation, or with attempts at diagnosis and treatment, as in the passage of sounds, the use of tents, instruments and manipulations. The pelvic abscess is usually either a pus-tube or a circumscribed peritonitis—the former far more common than the latter, especially in chronic and recurrent cases. Abscesses of the sub-peritoneal fibrous tissue of the pelvis may occur, usually proceeding from the uterus as a suppurative parametritis and rarely attaining a size to be confounded with the previous varieties.

Both the simple and infective forms of pelvic inflammation may result in adhesions, chronic adhesive peritonitis, and in thickenings of the parametrium—chronic parametritis. The former are the chief cause of uterine displacements, the latter are less frequent, and are usually so situated as to produce but little mechanical disturbance.

Simple forms of pelvic inflammation are frequently unavoidable, and, as a rule, require simple treatment, this chiefly medical. Infective forms of pelvic inflammation are largely avoidable, immediately or remotely injurious or dangerous to life and well-being, and generally demand treatment by surgical methods.—Annals Gynacology and Padiatry, June, 1892.

II. The Conservative Treatment of Salpingitis. By PAUL F. MUNDE, M. D. (New York). A slight, more or less acute or subacute inflammatory enlargement of the Fallopian tube, even though it

be detectable by the finger per vaginam, does not warrant the removal of the diseased organ until all palliative means at our disposal have been carefully tried. Pus in the Fallopian tube, pyosalpinx, always calls for its evacuation. If only one tube is involved and that tube is not freely movable in the pelvic cavity, and the appendages of the other side are normal, it would be justifiable to aspirate the tube per vaginam and finding pus, enlarge the incision, wash out the tube and insert a drainage-tube. When both tubes are involved laparotomy is the only correct treatment.

The conservative treatment may be divided into two sections:

- I. The palliative, including the forms of treatment by which it is intended to cure the inflammation or empty the distended tube without any dangerous operative procedure, that is, without opening the abdominal cavity.
- 2. Those methods which necessitate abdominal section and the attempt to restore the normal calibre and normal relations of the tubes.

Acute inflammations of the tube are treated on the same general principles as acute peritonitis. When it becomes subacute mild applications of iodine and glycerine, equal parts, may be made to the vaginal vault, accompanied by glycerine tampons. Daily warm sitz baths at 105° F. for half an hour may be given and blisters applied over the abdominal skin on the affected side.

All the operative conservative methods of treatment imply an abdominal section, but the tubes and ovaries are not removed unless they are irretrievably diseased, but if attached they are freed from their adhesions and small cystic degenerations or cystic Graafian follicles may be treated by the Paquelin cautery or excision.

Theoretically, M. suggests the liberation of the tubes, the expression of their contents into the uterine cavity, the insertion of a syringe into the fimbriated extremity and the injection of a 1-15000 bichloride solution through the tube into the uterine cavity.—Am. Journ. Obstet., July, 1892.

III. The Total Ablation of the Uterus for Large Fibrous and Fibro-Cystic Tumors of the Uterus. By M. Pean (Paris). For tumors not larger than the head of a feetus at term, P. has demonstrated by the property of the Uterus of the Uterus.

strated that they can be removed almost without danger by the vaginal route, preserving the uterus or not, according to the indication. When the mass of the tumor is larger than this it is customary to have recourse to abdominal section. The extra peritoneal treatment of the stump after the removal of the uterus, i. e. the attachment in the lower angle of the abdominal wound, has the advantage of rapid execution, and of not exposing the peritoneum to the danger of soiling from contact with the surface of the stump, and it also permits the surgeon to look after the hæmostasis and the dressings more carefully.

There are some cases where the tumor occupies both the body and the neck of the uterus, in which case the whole organ should be removed. The following is the technique now employed for these cases:

After opening the abdomen the tumor is drawn out as usual by means of a long curved trocar of P.'s own invention. A rubber ligature is then passed as near to the neck as possible and held in place by long forceps. The whole mass is then removed some centimetres above this. If there are several lobes of the tumor they are dealt with in regular order. If there only remains the neck and a small portion of the body of the uterus, care is taken to detach the bladder and the rectum when it is necessary and to ligate the small vessels. A metallic suture is then passed just above or below the rubber ligature and twisted tight by means of a special instrument designed for the purpose. The stump is then cut off as close as practicable in order that its volume may be diminished as much as possible. Care must be taken that the metallic ligature does not slip. The stump, remains of the uterus and metallic ligature must then be removed, and this is readily done through the vagina, following the rules which P. has advanced for the removal of small uterine tumors, that is to say, clamping the ligaments with his special forceps and employing morsitation.—Annales de Gynecologie, June, 1892.

SAMUEL LLOYD (New York).

IV. A New Method of Securing the Pedicle Intraperitoneally after Hysterectomy. By Dr. B. F. BAER (Philadelphia). Pass a *single* ligature through the broad ligament close to the neck of

the uterus, but avoiding uterine tissue, and tie outwards. Then sever the broad ligament with scissors between the ligature and the Fallopian tube and ovary. Repeat this on the opposite side. Then run a knife lightly around, incising the peritoneal covering of the cervix. Next strip the severed edges of the peritoneum downward with the handle of the scalpel for the purpose of making peritoneal flaps. Then pass another ligature through the severed broad ligament alongside of the cervix, including the uterine artery and the double fold of the ligament in one sweep. Repeat this also on the opposite side. This ligature serves the double purpose of controlling the uterine artery, and of closing the opened broad ligament. The constant traction kept up during these manipulations, after the peritoneal covering has been incised, serves to still further draw out the cervix and to thereby permit deeper incision into the tisques of the neck, which is now amputated with the knife by deep wedged-shaped incisions. The vaginal portion of the cervix being thus released, it immediately recedes and is drawn deeply into the pelvis by the retractive and elastic property of the tissues, where it is buried out of sight by closure of the ligated broad ligaments over it. No hemorrhage follows, and the pelvic cavity is seen to be clean and smooth. According to Schroeder's method the amputated cervix is covered with peritoneum, secured by a row of sutures. But the two lower ligatures, applied to control the uterine arteries, so constricts the broad ligament that after the cervix is severed, they as effectually close the cavity into which the cervix drops, as if a row of sutures had been applied for the purpose. The author has treated the pedicle in this manner in six hysterectomies and the patients have all made a smooth recovery. This experience shows that it is unnecessary to spend the time required to place sutures for the purpose of covering the stump with peritoneum, after the manner of Schroeder. Another decided advantage of this method is the absence of constricting ligatures of any kind or form from the muscular tissue of the cervix. This has been the one thing most dreaded by operators, and has caused them to hold to the extraperitoneal treatment of the pedicle by the serrenœud, or to resort to total extirpation. Total extirpation of the cervix should not be done unless the disease is malignant. The

vaginal walls should not be severed if it is possible to avoid it, for the vagina is unquestionably more relaxed at its upper portion in consequence; and the natural contour of the floor of the abdomen is destroyed when the cervix, the keystone of the arch, has been removed. There is no reason why we should not leave a small quantity of cervical tissue. Vaginal examination a long time after total extirpation of the uterus shows the vagina narrowed and shortened, whereas, when the cervix is left, the natural contour is so well maintained that it is difficult to tell by vaginal examination only, that a hysterectomy had been performed.—Annals of Gynecol., Aug., 1892.

V. Results of Hepterectomy for Carcinoma. By Prof. OLSHAUSEN (Berlin). Author believes that vaginal extirpation of the carcinomatous uterus does not obtain the recognition that it deserves, although the results, compared with those of extirpation of other carcinomatous organs, are favorable, the final results are not to be compared with those following extirpation of the rectum. The disease may recur in the third or even the fourth year after the operation, while in the fifth year it very rarely is seen to reappear. After the fifth year, out of four hundred or more cases, the writer has never seen a recurrence. The primary mortality of those cases, 235, which were operated during four and a half years, was 12.8 per cent. Of 155 cases which were five years under observation, 25.7 per cent. could be counted as free from recurrence. Olshausen explains the lasting results by the fact that carcinoma uteri long remains a local affection, in consequence of the slight development of the lymphatics, in this organ. The condition is otherwise in the pregnant uterus, for operations on a puerperal or pregnant uterus present a much more unfavor-The speaker presented forty-one extirpated uteri which were derived from patients free from recurrence, for at least two years. Seven had carcinoma of the body of the uterus, thirty-four cervical carcinoma. Nine of the patients have remained free from recurrence for two to three years, eleven three to four years, twelve four to five years and nine five years or longer. In the discussion following, Schede, of Hamburg, spoke in terms of praise of Hochenegg's sacral

method. At first this method appears contrary to all sensible surgery yet the field of operation is better brought into view, the uterine appendages, parametria, and ureters are easily accessible. This method renders cases operable which with the vaginal operation are inaccessible. Schede has had thirty-five such cases which will be published in the Annals of the Hamburg Hospital, Vol. II. As to the capabilities of the operation he observed a case in which in a patient, where together with total extirpation of the uterus a large piece of the adherent ureter as well as a portion of the vesical wall, of the size of a dollar, was removed. This woman, is still, two years after the operation, completely well.—Verhandl. d. Deutsch. Gesellsch, f. Chirurg. XXI. Kongress, 1892.

FRANK H. PRITCHARD (Norwalk).

VI. The Technique of Vaginal Extirpation of the Uterus. By Dr. Duchessen. While in cases of undoubted carcinoma of the uterus, total extirpation, rather than partial, is almost unanimously preferred, yet opinions still differ as to the methods of operating, especially as to whether treatment by clamps or ligature of the broad ligament is preferable. The author has tried Richelot's treatment by means of clamps and in the first place objects to the amount of room taken up by them. Nor will he admit the greater reliability of these in arrest of hemorrhage, the percentage being no more favorable, as Langdon lost 8.6 per cent. and Pernice 13.3. Finally the gain of time is not so important in cases of vaginal total expiration, according to Gusserow, as in laparotomies.

Another obstacle in the performance of vaginal total extirpation is the disproportion between the width of the vagina and the size of the uterus. This is overcome by D. by means of incisions, either vagino-perineal or by several superficial vertical incisions in the anterior and posterior edge of the vaginal wounds.—Charité Annalen, XVI., pp. 513-22.

GEORGE RYERSON FOWLER (Brooklyn).

VII. Duhrssen's Method for the Operative Cure of Retroflexion by Vaginal Fixation. By Jacob Rosenthal, M. D. (Berlin). But one special instrument is required; this is like a male

prostatic catheter, of No. 10 English calibre, with the handle curved in a direction opposite to the beak, so that when introduced into the uterus it may be easily held and out of the operator's way.

Two assistants are required. The patient is anæsthetized and the uterus anteflexed by downward traction on the cervix. For this purpose three volsellæ are used, two placed in the anterior and one in the posterior lip of the cervix; these are given to an assistant, who makes steady traction outward and downward. This bringing the uterus forward, a needle armed with a long silk thread is thrust through both walls in its central axis and as high up as can be reached, the ends of the suture being given to the same assistant, who continues traction with this added force until, in the ordinary-sized uterus, three such threads have been passed, placed one above the other, and as high up toward the fundus as possible. With the aid of these three sutures the uterus is strongly anteflexed and held against the anterior vaginal wall. Where the uterus is of large size four such threads are used.

The second step of the operation is now begun. A male catheter is introduced into the empty bladder for the purpose of defining its boundary as it lies between the reflexed anterior vaginal wall and the uterus (as the instrument is in the bladder until the operation is completed, a rubber cap is fitted over its tip to prevent the entrance of air). The prostatic sound is now introduced into the uterus for the purpose of holding that organ steady in the median line. The second assistant holds the catheter and irrigator with one hand, the uterine sound with the other. Pressure with the catheter in the bladder showing its lower limit, a transverse incision (the only one of the whole operation) is made a half-inch below in the reflexed anterior vaginal wall, to the depth of its serous layer; then, with the finger or the blunt end of the knife, the vaginal tissue, with the bladder, is dissected off from the uterine wall sufficiently to leave a pocket in which are felt the round outlines of the fundus.

The third and important step of the operation is the fixation of the uterus by means of three permanent sutures. A needle armed with silk is passed through the serous vaginal tissue of the pocket into the body of the fundus and out again, and then tied; this suture is placed as high up on the fundus as possible and in the vertical axis of the uterus. Two other sutures are placed in like manner one on each side of the first and about a quarter of an inch below it. It is important that the prostatic sound hold the uterus in the median line, so that these sutures will not be unevenly inserted. Where the anterior vaginal wall is thin the sutures are thrust through its entire thickness.

The catheter and sound are now withdrawn, the incised wound closed by means of a continuous catgut suture, and the three temporary stitches of the first step of the operation, with the volsellæ, are removed, and the operation is complete. No after-treatment is required.

In the Königliche Frauen-Poliklinik, of Berlin, the patients, after narcosis wore off, rode to their homes, lay in bed four to six days, and then reported. If, as in some cases, the permanent sutures had worked their way through the vaginal wall, they were removed; otherwise they were left undisturbed.

One hundred and fourteen cases have been operated by Dr. Dührssen during the last twenty months, with ninety per cent. perfect cures.—Amer. Journ. of Obstet., Sept., 1892.

VIII. Combined Gynæcological Operations. By Dr. G. M. Edebohls (New York). The tendency of modern gynæcology is to progress in a surgical direction.

The uncertainties and unreliability of other methods of treatment, as compared with the results obtained by surgical measures, are proverbial.

With the rapid strides forward of surgical gynæcology, this contrast is daily becoming more accentuated.

Increased confidence in results growing from increased experience and progressive skill will incline the individual operator more and more to trust to surgical resources.

Many cases require more than one gynæcological operation to effect a cure.

All gynæcological operations required in a given case should at the present day, as a rule almost without exception, be performed at the same sitting. The patient has a right to expect this from the expert claiming to possess the highest degree of operative skill. That this will be the standard of the near future the author does not doubt.

Success in combined gynæcological operations presupposes first of all perfect asepsis and a not too prolonged anæsthesia. The duration of the latter need but very rarely exceed one and a half hours, even in the most difficult cases.

Other things necessary are the requisite degree of operative skill and dexterity, sufficient and efficient assistance, a perfected technique of the various operations attempted, and an instrumentarium suitable for rapid work.

Combined gynæcological operations may be divided into two general classes:

- 1. Combinations into which a laparotomy does not enter.
- 2. Combinations of which a laparotomy forms parts.

The expert operator should be able to perform any required combination of operations of the first class within the time-limits of safe anæsthesia.

The same statement holds good of the combinations of operations of the second class into which a *simple* laparotomy enters. When a *difficult* laparotomy forms part of the combination the patient's interests may occasionally be better served by operating at two sittings.

There is no excuse for a mortality in combined operations of the first class. The mortality of combinations into which a laparotomy enters will depend upon that of the special intra-abdominal operative interference required.—Amer. Journ. Med. Sci., Sept., 1892.

IX. Abdominal Section for Recurrent Pelvic Peritonitis. By C. T. Cullingworth, M. D. (London). Six cases are reported with remarks. (1) A single woman æt. twenty-five, suffered two and a half years previously from pelvic inflammation following gonorrhæa, and since that time has been subject to similar but less severe attacks of pelvic pain. For a little over two months she had suffered from severe abdominal pain with a swelling in the lower part of the abdomen. The abdomen was found to be somewhat resistant, with considerable pain and tenderness, especially in the left iliac

region; a smooth, tense swelling was defined in the left lower half of abdomen, extending upward as high as the umbilicus; on the right side was a similar smaller swelling, a distinct sulcus being evident between the two. The tumors could readily be felt per vaginam. Abdominal section revealed two suppurating ovarian cysts; the larger one on the left side contained over a pint of greenish-yellow inoffensive pus, which was withdrawn by trocar and canula; the contents of the smaller on the right were similar. Both cysts were intimately adherent to the surrounding parts and especially to the rectum. There was no cellulitis. The Fallopian tubes were thickened and elongated but otherwise normal. Extensive dense adhesions rendered difficult the removal of the tumors, the right cyst being ruptured in course of the operation. The abdomen was freely douched with boracic acid lotion, suitable drainage provided and the wound closed with the patient in a collapsed condition. She made a good recovery, however, the drainage being removed on the twelfth day, and leaving hospital on the forty-third.

(2) A married woman, æt. thirty-two, with prior regular menstruation, no history of gonorrhea, had suffered abdominal pain of a more or less severe character for six weeks, during the latter half of which time a painful and tender swelling has been noticeable in the lower part of the abdomen. Palpation defined a smooth, tender swelling, with indistinct sense of fluctuation. Bimanual examination discovered the uterus to be pushed forward and to the right by two tense cysts, the larger one occupying the right posterior quarter of the pelvis, and the smaller a similar position on the left. Temperature 101° to 102.8°. Abdominal section showed the tumor to be ovarian, cysts containing extremely offensive pus, intimately adherent to all the pelvic organs; in course of their removal the appendix vermiformis was torn across, and found to be thickened and inflamed and with the lining membrane denuded of epithelium and covered with lymph. The abdominal cavity was douched with boracic lotion, two drains introduced and the wound closed. The discharge was purulent and offensive for some time, but on the sixteenth day it was inoffensive, and the tube was removed, the patient being discharged on the thirtieth day.

- (3). A married woman, æt. 27, complained of abdominal pain of five years' duration, manifested in attacks of two or three days' duration and at varying intervals, the longest being five weeks. Treatment for pelvic cellulitis had produced temporary improvement, but had been followed by increased frequency of the attacks. Vaginal examination revealed a hard irregular mass, quite fixed and somewhat painful, occupying the left posterior quarter of the pelvis, but there was no evidence of fluctuation. Abdominal section found the soft posterior quarter of the pelvis occupied by a tense inflamed ovarian cyst, roofed in by adherent intestine and omentum and partly covered in front by the thickened and inflamed left broad ligament. The adhesions were broken up, the cyst being ruptured during the process and giving exit to much purulent and highly offensive matter. After entire removal of the tumor, the wound was treated in the usual manner and a good recovery ensued. The cyst showed every evidence of intense inflammation. The patient subsequently had two attacks of pain of short duration, but the general health continued to improve.
- (4). A married woman, æt. 27, since an abortion seven years ago, has been subject to severe attacks of abdominal pain. Rigid abdominal walls interfered with examination, but under anæsthesia, a tense smooth fluctuating swelling, the size of a fist and separate from the uterus, was discovered in the right posterior quarter of the pelvis and depressing the right fornix. Abdominal section discovered in that place a globular tense cyst adherent to the surrounding parts and to the small intestine. Rupture of the cyst during its removal permitted the entrance of some of its purulent contents into the peritoneal cavity. A thickened and inflamed tube was removed with the cyst, the abdomen and wound treated as usual and a cure obtained.
- (5). A primipara, æt. 31, consequent upon unusual exertion had been seized with acute abdominal pain fifteen months previously with symptoms leading to a diagnosis of intra-peritoneal hæmatocele and right hæmato-salpinx. She refused operation, and got along fairly well until within two months, when severe abdominal pains at the catamenial period began. Examination showed a rigid abdomen with considerable tenderness below, especially in the left iliac region; per vaginam the left fornix was depressed by a firm irregular tender ma-s,

the size of a duck's egg. On abdominal section, the pelvis viscera were found obscured from view by adherent omentum and intestine, after separation of which, the left Fallopian tube and ovary were found to be enlarged, inflamed and densely adherent. Rupture of diseased ovary, in removing the diseased parts, allowed the escape of its purulent contents. The abdomen was thoroughly douched and drained for forty-eight hours, and the patient discharged three weeks later.

(6). A married woman, æt. 39, suffered a year previously from an attack of severe abdominal pain from which she remained well until three weeks ago, since when she has been suffering continuously from The abdomen was normal but examination by the vagina showed a firm irregular mass, about the size of a hen's egg, in the right posterior quarter of the pelvis. Abdominal section revealed an omentum firmly adherent to the anterior abdominal wall and troublesome, dense and vascular adhesions between the uterus and the intestines. Separation of these discovered the right Fallopian tube, dilated and flaccid, continuous with the enlarged ovary, which was lying deeply in Douglas' pouch imbedded in adhesions. These parts were freed with great difficulty and removed, about three ounces of blood-stained inoffensive pus escaping from the ovary. The removed portion of the tube was the subject of acute purulent inflammation. The abdomen and wound were treated as usual. Convalescence was retarded by a fæcal fistula which appeared on the fourth day, consecutive to a fit of vomiting the night before. The wound, however, closed and the patient was discharged on the forty-ninth day after the operation. A week later, the sinus re-opened, giving exit to a free discharge of inoffensive pus, but otherwise the patient's health was excellent.

Dr. Cullingworth remarks, in connection with these cases, that re-current pelvic peritonitis is in the immense majority of case an indication of the presence of pus, either in the Fallopian tube, the ovary, or in both. It therefore almost invariably calls for surgical treatment, for the anatomical position of the tube is such that pus once poured out cannot drain away as in most, if not all, other mucous surfaces, while in the ovary the imprisonment of the pus is, if possible, even

more absolute. With regard to the source of the infection of an ovarian cyst, the Fallopian tube, as in the first case, seemed to be the most common, but it is not the only cause; in the second case, for example, it is more than probable that it was an extension from an inflamed vermiform appendix.

These cases show well the tolerance of the peritoneum to the passage over it of fœtid pus or even of fæces for many days without injury, provided ample means are provided by which the offensive material can be cast off by intra-abdominal pressure. The author believes that the avoidance of injury from rupture of the suppurating cysts was due to the subsequent irrigation; he believes in flushing the peritoneum, but does not think it effectual to the extent of washing the surface absolutely clean. He provides free drainage for at least some hours afterward, where pus has escaped, so that any portion that may remain after the flushing and sponging, may find an easy vent; the intra-abdominal pressure is then usually quite equal to the task of forcing its expulsion. Where there is the least fear of escape of intestinal contents, free drainage should be provided for the same reason, thus avoiding consequent peritonitis. The good results of these and similar cases show that the method of entirely removing the cyst is infinitely preferable to that of merely emptying and draining the abscess cavity and stitching the cyst wall to the edges of the abdominal incision. The author does not think that the most formidable adhesions should deter the operator from attempting the more complete operation.—London Lancet, July 2 and 9, 1892.

X. Intravenous Injection of "Normal" Salt Solution for the Grave Hemorrhages of Midwifery. By HERBERT R. Spencer. M. D. (London). Recognizing that death from hemorrhage lies not in the loss of corpuscles or hæmoglobin, but in the loss of fluid and the consequent incomplete filling of the heart and that, as long as the blood can be kept moving by injection of fluid, life can be saved, the author has used "normal" salt solution for this purpose in eight cases of which four recovered and four died.

Of the cases which died, two were accidental hemorrhages in both of which his patient was beyond hope before this treatment was applied and of the other two one had an extensive laceration of the lower segment of the uterus and a hæmatonea of the broad ligament, death occurring from shock rather than from hemorrhage; the third case was a central placenta præiva and cervical laceration which, the author thinks, might have recovered if a second injection had been made.

Of the cases which recovered, two were examples of adherent placenta, with post-partum hemorrhage, and two were cases of accidental hemorrhage. In two patients the operation was performed a second time, making six successful operations in all. The author's experience in severe hemorrhage has been very extensive and he applies intravenous injection only in those cases where all other means have failed.

Before performing the operation, the bleeding is definitely controlled. The author applies an apparatus consisting of a glass bottle holding two pints, with an india-rubber stopper, through which pass a thermometer, a thistle-headed tube (for the purpose of replenishing and for the admission of air) filled with antiseptic wool, and a delivery tube to which is attached about four feet of rubber tubing with a glass or vulcanite canula. The apparatus having been washed with a 5 per cent. solution of carbolic acid and with boiled water, is filled with hot boiled distilled water containing one drachm of sodic chloride to the pint. When the bottle is filled, the solution is maintained at a temperature of 105°, by placing the bottle in a vessel, into which hot or cold water is poured from time to time. The solution is made to run by blowing with the mouth through the wool-plugged tube and raising the bottle about two feet above the patient's arm. A longitudinal slit is then made in the skin over the median cephalic or basilic vein; if assistance is not at hand, it is better to make a transverse slit through a fold of skin, as the elasticity of the skin then makes the wound gape; the vein is isolated and three fine silk ligatures passed under it; the lower of these is tied, the vein picked up with the forceps and opened by a scalpel, and, the solution having been set running, the canula is inserted and tied in with the middle ligature. The solution should be allowed to flow slowly, the bottle not being raised too high. The injection of thirty or forty ounces will in nearly all cases be sufficient, and the operation should take from twenty minutes to half an hour. In case of relapse, the operation may be repeated on the other side. After the operation the canula is removed, the vein tied with the upper ligature, the wound closed and a back splint applied. If necessary, stimulants may now be administered with greater benefit than before the operation.

The author concludes with the opinion that the operation, properly performed is neither attended by danger nor followed by evil consequences, and that it will afford remarkable relief in cases of severe hemorrhage—not complicated by shock—after all ordinary methods of treatment have failed.—London Lancet, June 15 and 18, 1892.

JAMES E. PILCHER (U. S. Army).

REVIEWS OF BOOKS.

AN AMERICAN TEXT-BOOK OF SURGERY FOR PRACTITIONERS AND STUDENTS. By CHARLES H. BURNETT, M.D., PHINEAS S. CONNER, M.D., FREDERIC S. DENNIS, M.D., WILLIAM W. KEEN, M.D., CHARLES B. NANCREDE, M.D., ROSWELL PARK, M.D., LEWIS S. PILCHER, M.D., NICHOLAS SENN, M.D., FRANCIS SHEPHERD, M.D., LEWIS A. STIMSON, M.D., WILLIAM THOMSON, M.D., J. COLLINS WARREN, M.D., and J. WILLIAM WHITE, M.D. Edited by WILLIAM W. KEEN, M.D., LL.D., and J. WILLIAM WHITE, M.D. Philadelphia, W. B. Saunders, 1892.

The preface of this large and handsome work opens with the statement that "The great advances which have been made in the Science and Art of Surgery within the last few years have created a need for new sources of reference, both for the student and the practitioner-a need which has been met to some extent abroad, but not so thoroughly in this country." The method employed in endeavoring to supply this need by this text-book is peculiar. Each subject was assigned to one of the large number of eminent men whose names appear on the title-page (all especially well qualified to know what the needs of the student are by practical experience in teaching), and then the entire work was submitted in proof-sheets to all the joint authors for criticism and revision. The editors are only responsible for the general plan of the book, the orthography, etc., but both are also among the authors. As the preface states, "the book may therefore be said to express upon important surgical topics the consensus of opinion of the surgeons who have joined in its preparation, although it must be understood that, while it thus represents in general the views of all the authors, each individual author is free from absolute responsibility for any particular statement. Minor differences in opinion necessarily exist, and are recognized in the text."

This peculiar method has its advantages and its disadvantages. The chief advantage lies in the fact that the book represents the prevailing opinion among several first-class men, rather than the independent views of any individual, and that is something especially desirable in a text-book, for students should rather be taught generally accepted doctrines, than new or peculiar views, no matter how clever or original they may be. Another great advantage consists in the division of labor which renders it easy to produce a work which is fully abreast of the times in all its departments—an impossible task for any individual in these days of rapid advance and constant change of front owing to the new discoveries being made in all directions.

The principal disadvantage of the method is a decided impairment in literary quality, a certain unevenness in the execution of the different sections, and a considerable loss of interest owing to the failure of individualization in the views set forth—for only in a few places does the reader actually feel the influence of the writer's personality. These, however, are not very serious defects in a work of this kind, and on the whole the book fulfils the wish of its authors to supply a comprehensive and thoroughly modern text-book of surgery.

The book opens with a capital chapter on surgical bacteriology, a knowledge of which now forms the first layer of the foundation of an education in surgery, and it is illustrated with excellent colored plates. A chapter on inflammation follows, giving a conservative description of the modern views of the influence of bacteria in its etiology. The next chapter gives a clear account of the process of repair in wounds with a good description of healing under the moist blood-clot, and of karyokinesis, but the changes which take place in repairing a broken bone are not fully enough described, either here or in the section on fractures, and there is not a single diagram to illustrate the repair of this, one of the most important of all injuries for the student to understand. The description of the method of occlusion of divided arteries is rather antiquated for it does not dwell sufficiently on the importance of the endothelial new growth in securing obliteration.

"Wound diseases" are well handled. The fact that the treatment of tetanus by Tizzoni's antitoxine is mentioned, is one of the many evidences the reader meets with, of the watchfulness with which the newer discoveries of our science have been recognized in this book. At the same time we must note the omission of all reference to the peculiar form of tetanus with facial paralysis ("Kopftetanus") which is by no means unknown in America. Anthrax, hydrophobia (Pasteur's preventive inoculations are approved), glanders, and actinomycosis are fully treated of, and a very complete description of all the lesions of syphilis follows. White's name among the authors is a guarantee of the excellence of this last section.

The chapter on tumors opens with a clear classification of their varieties and then takes up each sort in turn, giving a concise description of their structure, seats of predilection, diagnosis and treatment. The section on diseases and injuries of the blood-vessels hardly reaches the general high standard of the book. On page 237 it is stated that the treatment of aneurism by compression is more likely to result in permanent cure than that by ligation, in spite of the fact that modern surgeons tend to more rather than less vigorous methods in the treatment of aneurism. Certainly modern surgeons do not see "suppuration of the sac," or "a second aneurism form at the sight of ligation"—those dangers belong to the pre-antiseptic era. The modern revival of the method of extirpation of aneurism is hardly given due consideration, and the use of the suture in closing lateral wounds of veins is not mentioned. The usefulness of the infusion of salt solution is not sufficiently recognized, and the antiquated method of transfusion of blood is still countenanced.

The chapter on bone diseases is in one sense very complete, for there is not a single point which is not touched upon, periostitis albuminosa being described, and every possible method of dealing with the cavity left after sequestrotomy being enumerated, but in the matter of treatment the chapter has suffered from too rigorous compression, and this is unfortunate in a subject which is so important for students, while so many pages are devoted to operations upon the stomach, brain, etc. With such an authority as Stimson among the authors of the work, it is needless to say that the sections on fractures

and dislocation are perfect, and they are really wonderful in their completeness and conciseness, as well as for the excellent illustrations.

In the chapter on joint diseases, all the rest are well handled, but the section on tubercular arthritis is far from good, for not a single splint or apparatus is figured or described, and there is no proper consideration of one of the most important of the symptoms of tuberculous joint-disease, muscular spasm—merely passing allusions to "rigidity," "muscular contraction," and "tense tendons." Yet the modern treatment by iodoform injections is fully discussed, and the indications for the choice of operative or mechanical treatment in any case are excellently given—with the single oversight of not mentioning the importance of the patient's age in deciding this point.

The title of chapter X. must surely be a proof-reader's blunder, and instead of "Surgical Diseases of the Skin and its Appendages," should read, "Surgical Diseases of the Skin, etc.," for burns, lightning stroke, and dengue could not have been intentionally included under the former heading.

The department on regional surgery opens with a chapter on the surgery of the brain, perhaps the best in the book. It shows a more generous use of space than the rest, and is strongly marked by the individuality of its unknown author, making such fascinating reading that one is not tempted to ask too persistently why students should be instructed in all the details of the surgery of the brain. It is needless to say that everything is brought down to the present time, and yet with a judgment which rejects whatever is of doubtful utility. The chapter on the surgery of the spine is also excellent, very complete and thoroughly modern.

In treating of punctured and gunshot penetrating wounds of the abdomen, the authors say "Clinical experience and the result of experiment show conclusively that laparotomy should not be performed simply because a bullet or knife-blade has entered the abdominal cavity, but that its performance should be limited to the treatment of the intra-abdominal lesions, which without operative interference would tend to destroy life." To many surgeons this advice will seem very conservative, and it certainly is disheartening when taken in

conjunction with a sentence on the next page (677), "With the exception of the last-mentioned symptom [the escape of visceral contents from the external wound] and the indication pointing to the necessity of arresting internal hemorrhage, there is nothing about the local or general symptoms in cases of penetrating wounds of the abdomen which would enable the surgeon to decide with any degree of positiveness whether visceral lesions existed or not, and consequently, whether laparotomy should or should not be performed." It is somewhat curious that there is no hint of the fact that, when symptoms of visceral injury declare themselves by the beginning of peritonitis, it is almost invariably too late to save the patient by operation.

The description of the local symptoms in these cases, and the estimate of their value is capital. Remembering that Senn is one of the joint authors, it is with great interest that we read the following paragraph on the use of the hydrogen-gas test in such cases: "The use of hydrogen, while it has failed in a few cases, and in others has made the return of the bowels into the abdominal cavity more difficult, is, nevertheless, occasionally a valuable addition to our means of diagnosis and treatment. Many, perhaps the majority of, surgeons, however, hold that the difficulties and possible dangers it creates more than offset its apparent advantages." These Macchiavellian sentences illustrate some of the difficulties which hedge about a book constructed on the plan of combined authorship adopted here. An important error, doubtless typographical, occurs on page 692, where it is stated that in closing a wound in the stomach "about four sutures to the inch will be required "-of course it should be eight sutures. Intestinal obstruction is well treated and not a single expedient which the surgeon could employ for its relief has been omitted. In appendicitis the use of the exploring needle before the abdomen has been opened is rightly condemned. The sound advice is given to leave the appendix if it can not be easily removed from the abscess cavity, for fear of separating adhesions. It is to be regretted that some attempt was not made to specify the indications for operation in this condition, and the symptoms which render delay dangerous, difficult as it is to lay down any rules for these cases.

The indications for attempting the radical cure of hernia by operation are given wisely and clearly, and all the important methods are well and briefly described. Diseases of the urinary organs are adequately considered. So also are those of the male genitals, with the single exception of the far too brief account of tubercular disease of the testicle. The diseases of the female generative organs are treated with a completeness which deserves especial approval, for this field has been far too ea ily and completely deserted by the general surgeon to the gynecologist. An excellent chapter on the diseases of the breast follows, illustrated with capital pictures of the clinical appearances of all the important varieties of tumors of that organ.

Chapters on the eye and on the ear, containing all that the student requires in these departments from the surgical standpoint, close this part of the book, and we come to the final section on operative and minor surgery, which are excellent in their way. The chapter on amputation deserves particular notice for the sound eclecticism which prevails in the choice of the methods and modifications described, and yet none of great usefulness, are omitted. A good chapter on artificial limbs follows, a subject too often neglected in surgical text-books.

The typography and illustrations of this fine work call for the greatest praise, the broad page with its clear type making reading a pleasure, while the illustrations are really works of art, especially the large full-page plates VIII, XVIII and XXVI.

In closing one can only repeat what was said at the beginning—that the authors have supplied a text-book which treats of the whole subject of surgery from the modern standpoint with a thoroughness and success which is remarkable. The flaws which have been noticed are readily overlooked in the presence of the excellence manifest on every page.

B. FARQUHAR CURTIS.

REGIONAL ANATOMY IN ITS RELATION TO MEDICINE AND SURGERY.
By George McClellan, M. D. Volume II. Colored plates.
Philadelphia: J. P. Lippincott Company.

In this volume Dr. McClellan has completed his work in a manner leaving nothing to be retracted from the favorable notice given the first in the February number of this Journal. The plates are as well executed, and the explanatory text as clear and rendered as interesting by the many practical suggestions with which the author has favored his readers.

The desire for a scientific nomenclature is noticeable throughout this volume also. The term "Mons pubis," as applied, indiscriminately of sex, to the eminence of tissues over the symphysis, is certainly an improvement upon that of mons veneris in the female, and the hitherto unnamed, corresponding, structure in the male.

The most radical change of names in which the author has indulged has reference to the parts concerned in herniæ. The abdominal and femoral rings he designates "openings," and the transversalis, as the "extra-peritoneal" fascia. The abdominal rings he distinguishes as the "superficial" and "deep" abdominal "openings." The reasons alleged are hardly sufficient for rejecting the time honored names of these structures, especially when their surgical importance is considered. Anatomically speaking, the term "opening" is more objectionable than that of "rings;" neither do the adjectives "superficial" and "deep" indicate any better, if as well, as "external" and "internal" the relation of the abdominal rings to each other or to the contents of the cavity.

A few errors have crept into the text, such, for instance, as that the ilium forms less than two-thirds, instead of less than two-fifths of the acetabulum, and that the colon, upon the right side is the most favorable location for the operation for the establishment of an artificial anus. In making the bald statement that the ilio-hypogastric and ilio-inguinal nerves are purely sensory, it is doubtful whether it was intended to deny that the latter furnishes motor filaments to the internal oblique muscle. The remark that the portal vein conducts the blood to the liver for purification is not in accord with the scien-

tific character of the book. There are certain pathological reasons for considering the lobus Spigelii as distinct from and not a part of the right lobe of the liver, as stated. The assertion that *rotation* is very free in the lumbar region, can only be explained as an oversight.

It is the general excellence of the work, however, that renders this criticism possible.

The following quotations serve to illustrate the manner in which the author seeks to turn his observations to practical account.

"The twelfth ribs are rarely equally developed upon both sides, one or the other often being rudimentary. This is a fact which should not be overlooked, for the pleura is attached to the eleventh rib, and therefore, in operations upon the kidney, if it is desirable to enlarge the space by resection of the twelfth rib, there must be no mistake as to its identity."

Again:—"Observation made by the author upon the cadaver have demonstrated the manner in which the vesico-uterine fold of the peritoneum acts upon the body of the uterus. If the bladder is gradually distended while the bowel is empty, the fundus is raised until the organ assumes a decided anteflexion. This is probably aided by the lateral traction upon it of the round ligaments, which are rendered tense by the vesical wall being lifted up, like the cords of a balloon. In cases of acute retroflexion knowledge of this fact may sometimes be of service.

It is a mistake to suppose that the broad ligaments maintain the position of a vertical septum across the pelvic cavity in which the uterus is suspended. If they ever do it is only in the virgin state, for after the uterus has fulfilled its physiological function and the surrounding peritoneal ligamentous folds have been subjected to the strain involved by pregnancy and parturition the broad ligaments are relaxed, so that the uterus lies in a flaccid state between the rectum and the bladder. On account of this the various flexions and versions are apt to occur, but their occurrence does not always warrant the assumption that they require artificial support. There is usually too much meddling with this organ on account of some position which is considered incorrect, and the zealous practitioner might often do better if he would consider a little more closely the anatomical rela-

tions of the uterus instead of resorting to the use of a pessary. In very many cases where relief is thus obtained it is beyond doubt mainly through the wonderful connection between the hypogastric plexus of nerves and the imagination, for it is not a question of fitting the support to the uterus, but one of fitting the uterus to the support."

Dr. McClellan, in this volume, declares that there is no warrant for the operation of retrenching the round ligaments, opposes the operation of wiring the fragments in fractured patella, discourages any effort to obtain union of the fragments in intra-capsular fracture of the neck of the femur, favors open operations in preference to subcutaneous tenotomy for the correction of the various forms of talipes, condemns the use of instruments of small calibre in traversing the male urethra, except in the hands of experienced operators, and holds filiform bougies responsible for nine-tenths of the mortality in cases following their use. He bases his opinions upon personal experience and fortifies them by reference to the anatomical structure of the parts concerned.

The work complete in two volumes contains 97 plates and 786 pages of text. Its price is \$15.00, which though not excessive, when the form of its publication is considered, nevertheless places it in the class of high-priced books. This, it is to be feared, will limit its circulation and prevent a book of great practical value from reaching the very class which it is best calculated to benefit.

WILLIAM W. BROWNING.

FIRST AID IN ILLNESS AND INJURY. By JAMES E. PILCHER, M. D., U. S. A. 12mo. pp. 304. New York: Charles Scribner's Sons. 1892.

Among the books written for the guidance of the laity in the immediate treatment of medical and surgical emergencies this latest work is one of the best. Indeed among many examined by the reviewer there is none which contains so large an amount of accurate knowledge so clearly and succinctly stated. It covers a greater amount of ground than one could conceive to be possible within its comparatively small

bulk, for it is a handy volume for the pocket. This combination is made possible by the wise plan adopted of putting the most important points in larger type, reserving the less important matter for smaller type. Nor is this end accomplished at the expense of legibility. It is quite sufficiently large to be read easily and the publishers as usual have done most excellent press-work. The proof-reading as was to be expected from the author's well-known carefulness is perfect so far as observed. It is profusely and judiciously illustrated by sketches, engravings and photographic reproductions. While some of the cuts are smaller than is generally considered desirable, yet with the limitations of space in view, it is almost hypercritical to mention the matter at all. The binding is dark and durable, well suited to possible hard usage, and the title cover neat and handsome.

As to the matter of the volume. No one who has not made the attempt can realize the difficulty of "writing down" to the comprehension of the non-medical, when treating of medical and surgical topics. There is a fatal facility in the use of technical terms which is difficult to unlearn, yet without so doing there is a very real danger of nullifying the object of the writer. After a rather careful examination of this work no instance is found where Captain Pilcher has used a strictly technical term without succinct and sufficient definition—which is high praise.

The book contains about 300 pages. Eighty of these are devoted to the outlines of anatomy and physiology. This section is in many respects admirable for the fullness and simplicity of its teachings. Any one who masters this section will have a really scientific conception of the body as a whole, and of the correlation of its component parts. Attention should be called to the excellent and clear way in which the nervous, circulatory and digestive systems are treated, under the headings, respectively, of the Central Power, the Repair Apparatus, and the Digestive Apparatus, the three most difficult subjects to explain to the satisfaction of the laity.

In the next forty pages the "Implements of Repair" come under consideration. Under this heading micro-organisms and their agency in causing disease, together with methods of antisepsis, premeditated and impromptu, are dealt with. Knots and bandages,

dressings and applications, fomentations and counter-irritants are described and fully illustrated.

After this necessary preliminary matter come the hundred and thirty-six pages devoted to accidents and emergencies, constituting the animus of the book. There is a valuable chapter entitled "How to Act at First," with reference to self-possession, crowding, use of stimulants, method of examination and malingering. In due order follows a consideration of the causes, symptoms and immediate treatment of bruises, burns, and frost bites. A full statement of the varieties, methods of healing and treatment of wounds is found, as also of bleeding internal and external, traumatic and idiopathic. In connection with the latter subject detailed and intelligible directions are given for the arrest of bleeding from individual arteries by finger pressure or the improvised tourniquet. Sprains, dislocations and fractures receive ample space, and it is pleasing to note that the author emphasizes the fact that it is not necessary for the layman to apply improvised splints at once, if a surgeon is within calling distance, and afterward notify the medical man. The contrary has happened more than once. Foreign bodies, unconsciousness, convulsions, asphyxia by drowning or otherwise, poisoning and poisoned wounds comprise other topics which receive due explanation. The causes and proofs of death are adequately presented.

The author manifests his interest in the military side of his profession by furnishing two very interesting chapters on "The Emergencies of the Battlefield," and "Carrying the Disabled" The former chapter deals with provisions for treatment, the hospital corps, uniforms, work on line of battle, dressing and ambulance stations, field and permanent hospitals. The latter chapter gives in detail the United States Army litter drill. The volume ends with some useful information in regard to disinfection, and ordinary sanitation.

Dr. Pilcher is to be congratulated on having produced probably the best book on the subject yet published.

GLENTWORTH R. BUTLER.

DISEASES OF THE EYE. A Handbook of Ophthalmic Practice. By G. E. DE SCHWEINITZ, M. D. Royal 8vo, pp. 600. Philadelphia: W. B. Saunders.

This, the latest text-book on ophthalmology, is a handsomely printed volume of convenient size and neat appearance. Those who would ask if another such text-book be really required to supplement the very excellent ones so recently published, may find their answer in perusing this. It is clearly written, explicit, and gives the principles which govern ophthalmic practice of to-day in a manner which shows its author to be familiar with the needs of students and therefore of practitioners, for the latter naturally turn first to their old text-books in time of need. The subject-matter is conveniently arranged and comprehensively treated. The chapters on general optical principles, the theory and use of the ophthalmoscope, normal and abnormal refraction, the mechanism of diplopia and the causes of squint were written by Dr. James Wallace, and show him to be thoroughly conversant with his subject. His style is, however, somewhat concise, and at times might prove confusing to a beginner, as when he says that rays of light diverging from the principal focus of a convex lens after passing through that lens "converge at an infinite distance." In speaking of the indirect method of ophthalmoscopic examination the statement is made that in myopia the convex lens usually employed may be dispensed with in the higher grades, "though it is still an advantage because it increases the size of the image." Those who are familiar with the use of the ophthalmoscope will of course see that the area of the retina included in the ophthalmoscopic picture must be here meant, but to the student who is not quite sure of his ground such statements are very misleading. The chapter on the external examination of the eye is a very good one, aud in it is given a very complete schedule which may be followed wholly or in part. Here as elsewhere in the book stress is laid upon the importance of a recognition of the general bodily conditions. The various instruments and manipulative procedures necessary in such external examination are clearly described, and more recent aids are not omitted, such as the use of fluorescein for the detection of foreign bodies or corneal ulcers. The methods of testing the

extra-ocular muscles are clearly given, and the terminology proposed by Stevens for defects in the balance of such muscles adopted. But little is said of the ophthalmometer of Javal and Schiotz, so much lauded at present, beyond a description of the instrument. It is, however, one which is scarcely likely to be found outside the office or clinic of the specialist. The use of a mydriatic to reveal latent refractive errors is advised up to the age of fifty. In correcting errors in children too young to read dependence is placed upon the ophthalmoscope and retinoscopy, but no preference expressed. The different theories of the development of myopia are clearly given, and for young people with good vision the full correction of the myopia when moderate (under 5 D.) is advised. The use of fully correcting glasses for everything except close work is recommended for myopia less than 8-10 D. The chapter on refraction closes with some valuable hints on the verification of the accuracy of glasses as furnished and the proper adjustment of spectacles, a subject to which, as a rule, far too little attention is given.

The chapters on diseases of the eyelids, conjunctiva, cornea and sclera are excellent. The clinical pictures are carefully drawn, and in treatment not only the older and well-recognized methods but also more recent suggestions are considered. In general, however, there is a lack of expression of the author's individual opinion or preference. Follicular conjunctivitis is treated as distinct from trachoma, the former being "characterized by tumefied lymphatic follicles," and the latter by the "development of trachomatous nodules which should be regarded as new formations." In the operative treatment of trachoma squeezing out the granulations is favored rather than grattage, excision of the fold or the use of the galvano-cautery. Pyoktanin finds little favor except in suppurative disease of the tear passages. In perforating ulcers of the cornea with extensive prolapse of iris, after the ordinary efforts at reposition have failed, the author recommends excision of the prolapse in recent cases with the use of a conjunctival flap to cover the opening, a method suggested by Pinto.

The diseases of the iris, ciliary body, choroid, retina, optic nerve, vitreous and lens are clearly and methodically considered. As a rule the general features of a disease both pathological and clinical are given, and then the more special forms with the treatment appropriate to each. A very valuable feature is the extensive reference made to the more general bodily condition causing or accompanying the ocular disease, and the relations of ophthalmology to general medicine are constantly kept in view in the treatment advised. claim is made that operative treatment is necessary in practically all cases of glaucoma to check the disease. While this is unfortunately only too often the case, the experience is not so uncommon that the myotics are of permanent benefit. Iridectomy is the operation advised, but little reliance being placed upon sclerotomy, a good enumeration of the essentials of such an iridectomy being given. Both eyes should, in the author's opinion be bandaged after the operation, that on the operated eye to be retained until the restoration of the anterior chamber. The prophylactic use of eserine in the non-operated eye is recommended. The chapters on the various forms of amblyopia are excellent, and the diagnostic aids to localization of the lesion in hemianopsia are clearly given, including the more general symptoms of hemianæsthesia, hemiplegia and ataxic movements. The anomalies of the ocular movement, the diseases of the lachrymal apparatus and those of the orbit are next considered, and the book closes with a description of the technique of the operations ordinarily performed about the eye. This chapter begins with explicit directions as to antisepsis, the cleansing of instruments, preparation of the patient, etc. As elsewhere in the book there is here a noticeable avoidance of expression of individual opinion. The different methods are described and the choice left to the reader. In iridectomy no mention is made of any other instrument for making the section than the angular keratome, whereas in many cases the Graefe cataract knife may prove the more manageable instrument. A bandage is advised after cataract as after iridectomy. Graduated tenotomes are described, but the author says "there seems little doubt that a good deal of injudicious 'snipping of the tendons of the ocular muscles' has been practised."

On the whole the book is one of the best of its scope, and the author is to be congratulated on the excellence with which his purpose has been carried out. May its success equal its merits.

RICHMOND LENNOX.

GENITO-URINARY AND VENEREAL DISEASES. A manual for students and practitioners. By Charles H. Chetwood, M. D. Philadelphia: Lea Brothers & Co.

This little book, covering the essentials of genito-urinary diseases, belongs to that series of books which has lately become so dear to the medical student, the quiz compend: in which the various subjects are presented in the form of questions and answers. However childish the method may seem, the book contains in an available form the practical information, to find which we may read many pages in more elaborate works. It sets forth that which is being taught to-day in our medical colleges, and practiced in our hospitals and dispensaries.

The book is illustrated, and not too large to be carried in the pocket. It bears the evidence of having been compiled by a man well versed in his subject.

JAMES P. WARBASSE.

The Student's Handbook of Surgical Operations. By Frederick Treves, F. R. C. S. Philadelphia: Lea Brothers & Co., 1892.

This very excellent work needs no greater recommendation than the prestige which its writer's name bestows upon it. The author, who has given to the student the "Applied Anatomy," and the three volumes constituting the "Manual of Surgery," needs no one to speak the assurance, that, the "Handbook of Surgical Operations" shall meet with anything other than a welcome reception. The book is abridged from the author's exhaustive work, the "Manual of Operative Surgery," and embodies in a condensed form the essentials and technique of the most commonly performed operations. The general principles of operative surgery, the consideration of the merits of various surgical procedures, the anatomy of the parts, the after-treatment, the description of instruments, and the subjects of mortality and results, are not discussed. Simply the operations themselves are dealt with.

The book is thoroughly illustrated, and the subjects well classified. The operations are considered with reference to the seat of application. The whole subject divides itself into fourteen sections. Beginning with Ligature of Arteries, Operations upon Nerves, Amputations,

Operations on the Bones and Joints, it continues through the category, and closes with sections on Operations on the Rectum, Operations on the Head and Spine, and Operations on the Thorax and Breast. Under these headings are the sub-divisions, in which are set forth in the admirable style of Mr. Treves—lucidly, concisely, and yet completely—the procedures in the various operations.

The large amount of information in this small book renders it a valuable acquisition not only for the medical student, but for the practical surgeon as well: nor can it be too highly commended for the rare good judgment which has been exercised in the selection of the operative procedures to be described.

JAMES P. WARBASSE.

A New Pronouncing Dictionary of Medicine. By John M. Keating, M. D., LL. D., and Henry Hamilton. With the collaboration of J. Chalmers Da Costa, M. D., and Frederick A. Packard, M. D. Philadelphia: W. B. Saunders. 1892.

In 1839 the elder Dunglison wrote in the preface to the second edition of his dictionary, that, "the present edition will be found to contain many hundred more terms than the first, and to have experienced numerous additions and modifications." Succeeding publications of dictionaries must have followed this example, or have been inadequate to the demands of a growing and developing science. Of the past decade may it be said, that, the demand upon the lexicographer for new words, and the necessity for eliminating those which the progress of science has made obsolete, have become especially urgent. The amplification of the nomenclature has become so great that the frequent revising of existing dictionaries of medicine is a necessity, and the issuing of new dictionaries not unjustifiable.

The work which has just been placed in our hands commends itself as a pronouncing dictionary worthy of the attention of the medical profession. The question of the pronunciation of medical terms has received careful attention. A number of the professors of Latin in the Universities of this country have been consulted as collaborators in the work; although they have offered no remedy for the deplorable state of our mongrel system of medical pronunciation,

which distinguishes the English medical terminology, and that of the United States, from the rest of the scientific world, and impedes the establishment of an universal scientific language. Neither the continental nor the English method of pronunciation has been accepted, but, according to the preface, "we have, after careful thought, followed the custom of the majority of the English speaking physicians, and, though sanctioning both methods as coming from high authority, adopted in large part the anglicized pronunciation without hard and fast rules."

The definitions are, for the most part, clear and concise. The etymology of the words has been carefully traced. The book contains many recently coined words; and numerous words, now obsolete, but still printed in other dictionaries, are omitted. It is difficult to understand, however, why such words as endothelioma, aerobic, anaerobic, dicephalus, diplococcus, ecchondrosis, haematoblast, neuroblast, nigrosin, and osteoclast, which, among a promiscuous lot of words were looked for, have been omitted; and why place has been given to such terms as immersed, illusion, immobility, impetus, injury, inflated, freeze, flame, classification, rare, etc., which have no especial connection with the medico-scientific vocabulary.

A valuable appendix of eighty-two pages is added, which is given to weights and measures; diameters of the female pelvis and fœtal head, with illustrations; a table of cardiac murmurs; charts of the nerve distribution of the various plexuses; Starr's table of localization of functions of the segments of the spinal cord; a table giving the chief characteristics of the principal bacteria; ptomaines and leucomaines; an extensive dose table; incompatibles; a list of poisons with symptoms and antidotes; a list of the newer drugs, with physical properties, uses, etc.; preparations and solutions used in antiseptic surgery; and other minor subjects. The work is well printed in large type, on strong heavy paper. The evidences of the care and labor which has been devoted to its preparation are visible on its every page.

JAMES P. WARBASSE.

Editorial Note.

As the editors of the Annals of Surgery have been criticised regarding the advertisement that was printed in the November issue of the journal, it is but just to announce that they were as much surprised at its appearance in the journal with which they were associated as any one could possibly be, and that they immediately wrote to the publishers, who agree with them, that it should not appear in another number.

It is but just also to the publishers of the journal to add that they at once recognized that they had been deceived in the character of the advertisement by reason of the apparent high professional standing of the parties interested in it, and that they have

cancelled the contract.

It may be added that at the time the contract was made the General Manager of the company, and the American Editors were abroad and that the character of the college

and the medical man concerned was certified to by seeming good authority.

The Editors therefore, can state that the high character of the Annals has not been lowered, and that it will be fully protected in the future.

LEWIS S. PILCHER. I. WILLIAM WHITE.



THE RADICAL CURE OF HERNIA.

By THEODOR KOCHER, M. D.,

OF BERN.

PROFESSOR OF SURGERY IN THE UNIVERSITY OF BERN.

In the publication of our first forty-two cases of radical operations for hernia from 1875 until the end of the year 1886, the comparison of results showed a permanent cure in 83.4 per cent. of the cases, and recurrence in 16.6 per cent. Mayor, after carefully going over the cases, concluded that four out of five of the recurrences were due to the fact that the hernial ring had not been sewed. It is understood that those authors, who, as Bassini, limit themselves, in publishing their results, essentially to radical operations for inguinal hernias, show better final results than the surgeons who classify together all of their hernia operations.

From that time on we have always carefully sewed together the hernial canal, and on the ground of that procedure, we have regarded ourselves justified in extending the indications for the operation much wider than before. While we operated on only forty-two cases in eleven years; we have, from the end of the year 1886 until the middle of 1891, in four and a half years, operated upon three times that number; so that Dr. Leuw who has investigated the ultimate results in the cases during

Wergl. E. Mayor, Inaug. Dissertation, Bern, 1889.

Note by the Editor.—During a recent visit to the clinic of Professor Kocher, at Berne, my attention was arrested by the excellent results demonstrated in his wards from his operations for the radical cure of hernia, and especially by the fact that his patients were able to safely leave the hospital in from one to two weeks after having been operated upon. At that time I solicited from Professor Kocher a description of his methods of dealing with hernia for publication in the Annals of Surgery, and was pleased to learn that he had already a paper on the subject completed which was about to be published in the Correspondenshlatt für Schweizer Aertze. A reprint of this paper has been forwarded by Prof. Kocher. In the judgment of the editor it is of sufficient importance to warrant its reproduction in English in the Annals of Surgery. The translation has been made by Dr. James P. Warbasse.

L. S. P.

this last period, has had II9 patients to look up, whose operative clinical histories were full and exact. It is to be regretted that late reports from only ninety-four cases were obtained, so that we can employ only these in making a judgment of the final results.

When we had convinced ourselves of the importance of closing the hernial canal, we abandoned the Czerny-Risel method, and adopted another procedure—contrary to the views of certain authors, as especially Anderegg of Socin's clinic. Mayor regarded himself justified in the expression that, "an operation for hernia without suture of the hernial opening is in our eyes no radical operation at all." Czerny, who has done so much in other branches of abdominal surgery, and Risel, to whose proposition we will return, in the year 1877 amended the proposition of Nussbaum to ligate the hernial sac high up and remove it, in that they added to the operation the "canal suture:" that is the suturing of the two pillars of the anterior inguinal opening.

Our earlier publications emphasized that suturing the ring insured a permanent result; but our second collection of cases shows that it gives no guarantee.

When we compare, without regard to the methods employed, the ninety-four cases, it is seen that recurrence occurred in twenty—a higher per cent. than in the cases operated upon before the year 1886. The explanation is very simple: we had set the indication limits of operation much wider; we conformed to the wishes of the patients to try to cure them of their trouble, even in cases which previously would have been refused.

But of greater interest are the results of a more exact examination of the clinical histories, and especially of the method of operation. In two cases, the radical operation could not be regularly performed. Of the cases of 1887, the hernial sac tore away in the case of patient W. and could not be ligated. He had also a short time before been operated upon by the old method of Heliodorus. In the case of Emilie Ae., 1890, the suturing of the ring was not employed; so that this was a case operated upon by the method of Nussbaum.

¹Studien Z. Radicalbehand. d. Hernien, Wiener Med. Wochensch., 1877. ²Risel, Deutsche Med. Wochenschrift, 1877. Not less than eight of the cases of recurrence were cases upon which I myself did not operate; and in four of these, it is certain that merely the suturing of the ring, according to the old Czerny-Risel method, was employed. In three cases operated upon by me, and in which recurrence occurred, simply the uniting of the two pillars of the outer inguinal opening was done.

If we wish now to consider the method by which the majority of the cases of the second series were treated, but eighty-one cases remain. Among these, seven recurrences are shown; and it is worth the while to inquire upon what grounds these recurrences can be explained. Then it must be decided whether this method also is incomplete, and how it is to be improved.

The ground seems, a priori, sufficiently clear to explain these few recurrences. We have already stated that, unlike some operators, we operated upon nearly all the hernias which presented themselves at the clinic, with the exception of the cases in which there were proper contra-indications. The table of ages, compiled by Dr. Leuw, shows that of 104 patients, twenty were over fifty years of age. We have also operated upon cases in which a special disposition to the formation of multiple hernias was observed, which may be regarded as unfavorable for a permanent cure.

Finally, a very important circumstance is that the "period of quietude" required of the patients was entirely too short. When we exclude the infected and suppurating cases and those in which, on account of thrombosis, the healing process required a longer time, and consider only the 89 per cent. of cases which healed per primam, seven and one-half days elapsed before the patients were allowed up. In the eight cases—II per cent.—in which suppuration occurred, the duration of healing is calculated at twenty-three days.

That in this short period given to the healing of the wounds, the certainty of radical cure is not increased, is evident; and we agree with Macewen, that it is right and desirable that, after a radical operation, the patient remain six weeks in bed, and not return to work until after eight weeks. On account of limited space in the hospital, such an extension of the period is not possible; and, furthermore, the circumstances of the large number

of our patients are not such that they can give up their work for weeks or months for the purpose of obtaining a radical cure. When we assume that about one-fifth of our patients are subjected to a second operation for recurrence, and that still another interruption of work of eight or fourteen days must be taken into account, the gain in time and work, which we accomplish through our method of after treatment, is a very important one compared with the precept of Macewen. We could subject our patients to a third operation before we should loose them the same amount of time. The chief thing is that we cure the fourfifths of the patients, those who remain radically healed, with a minimal loss of time and sacrifice of every sort. In order to judge this method in comparison with others, every case in which suppuration has occurred must be thrown out of the consideration of the duration of healing. He who strives to secure the best results which the most modern asepsis affords, prima intentio healing-a complete union by adhesion in forty-eight hours-again and again finds himself confronted by cases, in which, as a result of accidental infection of a suture, etc., an abscess occurs, followed by a long process of suppuration. This can be prevented, as many surgeons do, by leaving the wound half open, and employing a drainage tube for from four to eight days. Such cases ought not to be called prima intentio healing. Suppuration occurred eight times in our ninety-four cases; and in the five cases in which the suppuration was deep, recurrence took place. It is certain that the most of the deep suppuration was due to what we are in the habit of designating as "implantation infection;" and it is easy to understand that, on account of the suture suppuration, which is usually followed by an unloosening of the knots, the suture gives away and the radical operation amounts to nothing.

A last point which, leaving the operation out of consideration, seems appropriate for the explaining of the cause of recurrence, is the discontinuance of the wearing of a truss. On the ground of the views advocated by Socin, that, the wearing of a truss is more harmful than useful, we made it the exception to allow patients to wear trusses after the operation. We now believe that we carried the thing too far. As a matter of course, the truss should be used in the not uncommon cases in which multiple

hernias arise; in those which present a great laxity of the abdominal wall, and especially of the region about the hernial ring; and above all, in the cases of unusually large hernias or those with large rings. It is, indeed, an ideal aim, to endeavor to make the patient immediately independent of the truss. In a careful examination of our cases, only two remain in which the leaving off of the truss can be held accountable for the recurrence. The one is a large scrotal hernia reaching as far as the middle of the thigh; and the second man has an unusually large crural hernia. There is no explanation for these two recurrences, other than the size of the hernias and the hernial openings, and in addition, also, the discontinuance of the truss.

It remains for us to describe the method, by means of which, when the wound healed well, we were able to obtain almost perfect results. In seventy-six cases, there were only two recurrences, which are sufficiently explained by the abnormal size of the hernias, and which, perhaps, would not have occurred had a truss been worn. We designate it as the "canal-suture method."

For years, we have in our clinic championed the idea, that—aside from the demand of rigid asepsis—the first and chief thing in the radical operation is this: the hernial sac together with the neck of the sac must be removed in toto; and not the slightest excavation in the peritoneum should remain, to make possible a pressing of the intestines into this infundibulum. As soon as this latter occurs, the wedge principle again begins to operate, and the intestines enter the peritoneal cone, and force themselves through the ring.

We followed in this regard the especial method which Berger¹ described as a procedure of Lucas-Championnière. Long before this publication of this particular surgeon, we always carefully isolated the hernial sac from all of its coverings down to the serosa; especial attention being given to the tunica vaginalis communis and the cremaster. The movability of the sac is in this way increased. It is then drawn down with all strength, in order, as much as possible, to put the peritoneum on the stretch, and the pedicle transfixed and tightly ligated with strong silk.

¹Traité de Chirurgie de Duplay et Reclus., Vol. 6, p. 730.

It has been unjustly doubted that this method suffices to remove every trace of a peritoneal funnel at the inner hernial opening. A preparation has come into our possession which furnishes the proof, that, in a well performed operation, the peritoneum stretches smoothly over the posterior opening—so very smoothly, in fact, that after a short time we were unable to discover, from the abdominal side, the seat of operation. The observations in the case, as they were made at the autopsy, are as follows:

Specimen from a bilateral radical operation for a crural and an inguinal hernia, obtained three weeks after the operation. Patient died of a lung infarction.

The entire thickness of the inguinal region on both sides was removed from the subject; so that the preparations include the operation scars in the skin, as well as the inguinal and crural rings on the abdominal side. The serosa at these points is perfectly smooth and shiny; and at one point in each preparation, is a very slight funnel shaped dimpling, from which radiate shallow folds of peritoneum. The silk ligature used in ligating the neck of the hernial sac can be seen glistening through the thin serosa. The closure at the ligated point is absolutely complete, so that the finest probe can not find an opening. About 1½ cm. from the place of ligation runs the epigastric artery with two veins. An inflammatory thickening can be seen about the neck of the sac. No adhesions of the abdominal organs are present anywhere about the seat of the operation.

Although from this direct observation of the results of the operation, we have learned what high ligation of the hernial sac can do, and what is to be expected from the operation; still we are convinced, with Risel, Czerny, Lucas-Championière, and others, that to insure a radical cure, another procedure must be added to the ligation of the sac—namely, a thorough closing of the hernial canal.

According to the conclusion at which Anderegg, under the influence of the observations of Socin, has arrived, the suturing of the canal can be dispensed with without any harm, in case that a smooth and tense covering of peritoneum can be secured over the posterior surface of the hernial opening. This is, however, a mistaken idea. The numerous experiences with hernias following laparotomy should have taught that, even after separate

suturing of the peritoneum, every chink in the aponeurotic or muscular parts of the abdominal wall offers an opportunity for the occurrence of hernia. How often do especially those surgeons, who do not take the trouble to apply an exact suture after laparotomy, have occasion to observe smaller or larger hernias appear in the linea alba. Where a new hernial opening is created, there appears, without any predisposing excavation in the overlying peritoneum, an hernia. Of course the predispositions due to congenital peritoneal excavations should not be taken into consideration.

According to the importance of the hernial opening, the relative frequency of recurrence after radical operation in femoral hernia is about the same as in inguinal and even in umbilical hernias. In the latter, it is easy, by means of a transverse suture, to perfectly and exactly close the hernial ring in the linea alba. Similar conditions prevail in inguinal hernias in women. Here the surgeon can completely and solidly close the opening without being inconvenienced by the round ligament and its accompanying vessels; and recurrence will not take place if the hernial canal has been sewed.

In the male, the spermatic cord hinders the complete closing of the inguinal canal; but the solid walls, and especially the fasciae, afford a strong support for tightly drawing up the sutures which surround it. This is not the case with the femoral canal. Above is the tense ligament of Poupart, but below only the slightly resisting pectineal fascia lies upon the pectineus muscle. This fascia presents at the pubic bone a transverse ligamentous thickening, which can be plainly seen on the lower side of the neck of the hernial sac. This is the ligamentum pubicum Cooperi. The pectineal fascia is not strong, so that a firm closing of the hernial opening may be hindered by the tearing out of the sutures.

In order to secure a smooth closure of the peritoneum, much pains has been taken in the manner of closing the hernial opening; and in recent time, many ingenious attempts have been made to accomplish this object.

The method of Barker, which endeavors to render the peritoneum in the neighborhood of the hernia less movable, with the

¹Brit. Med. Journal, 1887.

view of hindering subsequent extrusion, is worthy of consideration. Barker does not cut off the ligature with which the hernial sac has been tied, but passes it deeply into the inguinal canal and up through the abdominal wall, in order to firmly hold the neck of the sac, and with it the peritoneum about the posterior inguinal ring. We wish simply to express a doubt, whether the movable peritoneum can in this manner, by means of the short pedicle of the sac, be firmly held for any considerable time. Our own observation has taught us that, after a very short time, the serosa lies smoothly and movably over the place of ligature of the hernial sac. The neck of the sac tied up in this way certainly does not operate as a tampon.

The method of Ball¹ is quite similar. It consists in energetically twisting the sac, and then passing through the neck a ligature, by which it is made fast to the surrounding tissue. The torsion has the advantage, that it draws in the movable peritoneum about the neck of the hernial sac, and in this simple manner renders the peritoneal covering of the posterior ring thoroughly tense.

The methods of Macewen and Bassini have met with especial favor. Both methods are so thoroughly described in the more recent handbooks, that there is no need of here entering upon an exact description. Macewen² transfixes several times the isolated hernial sac, and ties it together as å folded tampon, which he fixes to the abdominal wall after the manner of Barker, by passing the needle deeply into the inguinal canal. This answers as a support behind the internal ring. We wish here to attribute the chief value to the fixation of the peritoneum, and not to the constructing of a tampon, when the hernial sac is not cut away.

How permanent the fixation is, where the sac is immobilized only at a circumscribed place, as in the method of Barker, remains a question.

The second step in the Macewen operation is very important. It consists in drawing up and firmly fixing, with a row of sutures, the posterior wall of the inguinal canal against the place of insertion of the aponeurosis of the external oblique

¹ Brit. Med. Journal, 1884 and 1887.

²Brit. Med. Journal, 1887.

muscle into Poupart's ligament. The inguinal canal, by'this means, is closed throughout its entire length; which is more important than the restoration of the oblique course of the canal, which Macewen emphasized. In this endeavor to close the inguinal canal in its entire extent, the spermatic cord is a very great obstacle: not so much in closing the external ring, but in closing the internal opening, it is an especial hinderance. The credit of having gone over this ground, and having in a salutary way removed the difficulty, belongs to Bassini. The proposal to cut away the testicle and spermatic cord in certain difficult cases can be justified only in exceptional cases.

Bassini lays open the inguinal canal, in order to be able to free the spermatic cord as far up as the place where it passes into the abdominal wall. This laying open of the canal affords the advantage of isolating with greater ease the hernial sac, so that it can be ligated and cut away as high up as is necessary. The spermatic cord is then lifted up with a hook, and the posterior wall of the inguinal canal, from the internal ring to the pubic bone, sewed in such a way that the fascia transversa is united with Poupart's ligament and with the border of the rectus abdominis muscle. The cord is then laid back upon the suture line, and the cut edges of the fascia of the external oblique muscle again united over it.

The advantage of the method of Bassini is evident. Instead of simply uniting the pillars of the external ring, as in the previous procedure, and leaving the point of entrance of the intestines into the abdominal wall unconsidered, Bassini creates a resistance at the point where the intestine first leaves the abdominal cavity. He obviates in this way the so-called *pointe de hernie*, with which the formation of hernias in general, and the formation of recurrences after radical operations, are introduced.

Since Mayor's statistics, we have not been satisfied with suturing the external abdominal ring for inguinal hernia, but have always applied deep sutures throughout the entire extent of the inguinal canal. Crowding back the spermatic cord, the finger is introduced into the canal; the needle is guided deeply into the same, and passed through the walls in such a manner as to bring them together. A running suture is not applied, but the five to seven sutures, which are as a rule necessary, are put

in in such a way that the abdominal wall is strongly elevated by each suture with a view to the application of the following one.

When one makes a dissection on the cadaver of the inguinal canal, he is easily convinced that the chief support of the canal is the tense ligament of Poupart. It is inserted, as Henle has so accurately described, by its outer inguinal pillar into the spine of the pubis in such a manner as to form a gutter, the concavity of which looks upwards. To the side of this gutter lies the thick lower border of the internal oblique and transversalis muscles. The first sends some of its fibers as loops upon the spermatic cord, constituting the cremaster muscle. At the external inguinal opening these muscles become thinner, and are lifted up by the spermatic cord out of the gutter of Poupart's ligament, so that the cord comes to lie in the latter.

After carefully dissecting out the spermatic cord, it is seen that the aponeurosis of the transversalis, passing downwards, is united with the posterior border of Poupart's ligament. This aponeurosis is quite resisting, and passes on as far as the tense aponeurotic border of the rectus abdominis muscle. The internal oblique muscle remains without muscular fibers still further towards the middle line. Its lower border can be sharply defined by dissection, and its aponeurosis passes on to the border of the rectus. But this aponeurosis, as well as that of the transversus, is not so far away as that of the external oblique muscle:

The fascia transversa appears simply as a thickening of the peritoneum. The fold which it forms laterally and parallel to the epigastric artery, for the reception of the spermatic cord, is not tense. Its continuation upon the spermatic cord, the fascia infundibuliformis, acquires, in case of hernia, a decided thickness.

An efficacious closing of the posterior inguinal ring by means of suture is, therefore, out of the question. What must restore a true resistance, is the firm union of the lower border of the internal oblique and transversalis muscles with Poupart's ligament, and on the other side especially the tensely stretched fascia of the external oblique muscle. In case of hernia, this membrane on the anterior wall of the inguinal canal suffers a diminution in its resisting power. As is shown in the illustrations, the tense fibers which pass inwards and downwards separate from one another, and only the weaker bundles of fibers,

passing upwards and inwards, form a support to the tissue in front of the spermatic cord.

The most important thing in closing the opening of an inguinal hernia can be accomplished without employing the method of Bassini of cutting open the canal. The spermatic cord is pushed back; and the sutures, beginning deeply in the canal near the internal abdominal ring, are passed through the internal oblique and transversalis with their fasciæ and through the tense separated fibers of the external oblique muscle. Whether the operation of Bassini is done or not, Poupart's ligament is always the point of support of the sutures beneath.

It is noteworthy that Bassini also observed of one of his cases of recurrence, that he should have included in the suture a larger portion of the deeper abdominal muscles. But we find it practicable, to completely close by suture the entire length of the inguinal canal, without cutting it open, and without the spermatic cord, as it remains in place, being any hinderance.

That this is the fact is evident from a comparison of our results with those of Bassini. Bassini1 observed seven recurrences—excepting one death—among 251 cases of unincarcerated inguinal hernia. Ninety-eight of his cases were not observed longer than from one to six months; and thirty-three, not longer than six to twelve months. These periods are too short to announce final results. We have in seventy-six cases—leaving out of consideration five cases in which suture suppuration occurred, and the sutures gave way—observed only two recurrences; and they were cases of unusually large hernias. Our observations include but a few cases which were under our notice less than a year; others were observed up to four-and-a-half years. In one of his recurrent cases, Bassini had not removed the sac as usual; and in a patient with double recurrence, catgut had been used; which very well explains the poor result. In two other cases, Bassini declares that there was not a real recurrence, but simply an abnormal bulging at the seat of the hernial operation. An hernia of large volume was present in one of the remaining two cases.

Bassini has therefore arrived at the conclusion that, although recurrences do take place in cases operated upon by his method,

¹ Langenbeck's Archiv. Bd. 40.

still they amount to such a small per cent., they do not detract from the value of the operation. Macewen has shown just as good results with his method. Out of sixty-four not incarcerated inguinal hernias and four not strangulated femoral hernias, operated upon from March, 1879, until January, 1890, Macewen observed only a single imperfect result. This was in a three-year old boy with a very large inguinal hernia, on which a truss had not been used. These excellent results of Macewen were reported by Lauenstein.

Macewen's method has the objection of being very complicated, so that a certain amount of experience is required; and still the results of his operations are not to be compared with those obtained by Bassini or by myself, because Macewen has his patients to lie in bed for six weeks, and to abstain from hard work for eight weeks. The method of Lucas-Championnière differs in this respect from our method. Seventy-four out of the 120 cases, which he reported in 1889, wore trusses after the operation. He had one death and six recurrences. We have already stated above that we agree with the opinion of this author, that the truss assures a cure after operations for large hernias, and in cases of especially lax and nonresisting abdominal walls. In all other hernias we do not agree with Macewen and Lucas-Championnière, but unite with Bassini in the view, that, a good method for the radical operation is able not only to radically cure the patient of his hernia, but to release him from the wearing of a truss as well; and that this result can be accomplished in from one to two weeks.

It has been left until now, to speak of the dangers of the radical operation. It is not necessary to go far back in order to see how these dangers were regarded in earlier time. A. G. Richter¹ says in closing the consideration of the radical treatment of hernias: "There is no means, no method of operation, by which the radical cure of an hernia can in all cases be surely accomplished: not one, which is without difficulty and danger. It is never advisable to operate by any method upon an hernia, which is not strangulated or which is not a source of great annoyance to the patient, simply with a view of radical cure."

¹ Anfangsgründe der Wundarzneikunst, 1798.

J. F. Dieffenbach¹ says in closing his remarks: "It is indeed superfluous to say anything here concerning the value of the radical cure of hernia. We can name all methods only dangerous and uncertain, and I repeat what none better than Lawrence has said against the operation: When any one has a strangulated hernia he subjects himself to the operation in order to save his life. But one who has a simple hernia puts his life at stake in order to be relieved of some inconvenience, and the operation still offers him no other hope than he had already had without it."

Dieffenbach further states: "I beg to repeat what the great anatomist Hesselback says of the radical cure: He asks what advantages to the surgical martyrs can grow out of Kern's daring treatment? He places at stake the lives of his patients, in order that they may afterwards be allowed to wear trusses."

All these adverse opinions have not dissuaded aggressive surgeons from seeking after new methods for the radical cure of hernia. Of course with the antiseptic era the question came upon entirely new ground. Still at one time, when according to Schede,² "the danger to life from the operation had become exceeding small," the same writer thought that the operation should be advised against in cases of reducible hernia, the retention of which by means of a truss was still possible, so long as the truss could not with certainty be dispensed with by cases which had been subjected to the operation.

This idea that, in reality, the operation for the radical cure should be limited to such hernias as could not be retained by a truss, and to irreducible hernias which gave annoying symptoms, was predominant until the beginning of the last decade. Socin,³ one of the chief advocates of the operation, expressed this view at the surgical congress in Berlin in 1879; and the same can be said of Weinlechner.⁴ In 1881 Reverdin under the influence of Schede, Czerny, Tilanus, and Langenbeck, declared that reducible hernias, which could be retained by a truss, should not be operated upon. In 1884 Munzinger⁵ expressed himself in a

¹ Die operative Chirurgie, Leipzig, 1848.

² Centralbl. für Chir., Nov. 1877.

³ Langenbeck's Archiv. Band 24, Heft 3.

⁴ Wiener Med. Blätter, 1879.

⁵ Inaugural dissertation.

similar manner, having drawn his conclusions from the results of the operations in Kroenlein's clinic in Zürich. Kraske, in 1882-3, discussed the question of castration, as a means of making possible a radical cure in severe cases of hernia.

In 1886 the opinion dared first to be announced that the radical cure is applicable, not only to hernias which give rise to troublesome symptoms and those which are incontrollable or irreducible, but to *all* hernias. Indeed, the most recent writers—Lucas-Championnière, Svensson and Erdmann—prefer to do the operation at an early age, in order that a man, who was destined for the coming years of his life to wear a truss, may at once be made independent.

From recent statistics it is easy to see that the danger to life from the operation has diminished to a minimum. Svensson and Erdmann¹ had one death among 106 cases—a woman who died on the tenth day of acute enteritis and nephritis, when the wound was completely healed. Lucas-Championnière had a single death among his 120 cases. Macewen lost one patient from scarlet fever, out of his ninety-eight. Bassini, from his 250 cases operated upon, lost but one, which died of pneumonia when the wound had aseptically healed. Among our 119 radical operations, only a single death has taken place; and that from pulmonary embolism with bilateral infarcta, on the fifteenth day after the operation, when the wound was completely healed.

It may therefore be boldly maintained, that, the operation for the radical cure for hernia, leaving the above method out of consideration, owing simply to correct asepsis, has become entirely without danger. Professor Sahli replied, when our report was made to the society of the physicians of Bern, that our one patient would probably not have died without the operation. Without going further we yield this point, as well for our case as for the analogous cases of Bassini, Macewen, et al. No statistics have ever been given, even in which the details were not figured, according to which there were no deaths out of the hundreds of cases operated upon. It is more than probable deaths would also be observed, if for a long time a hundred hernia patients of every position and age were placed under observation, and for whom nothing further was done than daily

¹ Nord. Med. Arkiv., Bd. 18, Nr. 8.

to set before them a good meal. There are always people, whose general health has suffered such disturbances, that nothing more than a slight blow is required to call out the most dangerous symptoms. Lucas-Championnière has called attention to the fact that these exceptional cases of death are by no means to be taken into consideration in comparison with the numerous dangers such as inflammation, strangulation, etc., which threaten the patient carrying an hernia. The surgeon should, in every candidate for radical operation, carefully examine for contraindications in the other organs.

Should we recapitulate the conditions necessary for the attaining of a positive radical cure, the first and chief condition is that of perfect asepsis. We know positively enough from our statistics, how a method, which in itself is technically perfect, in case of infection, amounts to absolutely nothing. The aseptic treatment of wounds first established the ground upon which the mechanical perfecting of the operation could be accomplished. It is interesting to observe the old things in the most recent technique. Procedures, which now in the aseptic era give beautiful results, had with slight modifications long ago been advocated and tried.

A point which is of great value in attaining a good result is the thorough isolating of the hernial sac from the surrounding tissue and the overlying fascia. The endeavors of the earlier herniotomists were wrecked because they did not isolate thoroughly enough, and much more because the spermatic cord and testicle were cut away with the sac. As appears from Albert's¹ writing, Heliodorus had already accurately differentiated the accessory hernial coverings from the true sac. Paré and especially J. S. Schmucker devoted much pains to this isolating of the hernial sac from its coverings.

It is conceivable, that, this careful dissecting, at a time when the meaning of infection was not known, must have had its great disadvantages; and that, the effect of this painstaking proceeding remained after the crude efforts of the herniotomists, who were in the habit of cutting away the testicle. It was not a long time ago that the proposal was again made to sacrifice the testicle, in

¹ J. Israelsohn, Radicalcur der Hernien. Dorpat, 1880.

especially difficult cases, rather than to jeopardize the chances of radical healing.¹

Protest is rightfully made against castration in any case: and when, in certain cases the isolating of the hernial sac seems especially difficult, it is difficult only for those who have not given sufficient study to the operation. It is a question of isolating not so much the entire hernial sac, and in case of old ruptures and congenital hernias, the often almost impossible separating of the testicle and lower part of the spermatic cord, but of carefully dissecting free the extreme upper part of the sac and the neck. As a rule, this is not difficult, provided that the accessory coverings, and especially the tunica vaginalis communis, are duly laid open. When the hernial sac can not be entirely freed at its lower part, it may be simply cut off and allowed to remain. Richelot² advised cutting through the hernial sac above the testicle, and then dissecting it loose as far up as the internal inguinal ring. Among the more recent surgeons, Bassini has called especial attention to this thorough isolating of the neck of the hernial sac.

The object of this is to so free the sac that it can be well drawn out and ligated so high up that no funnel shaped excavation in the peritoneum remains, into which intestine can again find its way.

The second condition necessary for the radical cure is the high ligation of the neck of the hernial sac. It is interesting to know that Heliodorus recommended that the sac be not removed too high up, for the reason that he did not use any ligature. When Ambrose Paré first introduced the ligature, the highest possible division of the sac was rendered practicable. Schmucker proceeded in this way. The ligature is best applied so that the neck of the hernial sac is pierced with a needle, and half of the neck included in one ligature, while the other ligature is thrown around the entire circumference. The sac is now cut away just below the ligature, and the peritoneum retracts through the internal ring. Among the recent writers who regard of the greatest value this highest possible ligation and amputation of the sac, are Banks, Ball, Lucas-Championniére, Bassini, Svensson and

¹ Kraske, Centralblatt für Chirurgie, 1882 u.1883.

² Bulletin de la soc. de chir. de Paris, XIII.

Erdmann. The suture of the neck of the hernial sac was again brought to recognition as a real suture by Nussbaum and Czerny.

The third important thing in the radical cure is the closing of the hernial canal. J. S. Petit seems to have in view a plugging of the canal by the reposition of the hernial sac. From then until the time of Gerdy, every possible method of closing the hernial canal has been tried. Wood employed the suture thirty years ago, by some subcutaneous method, for closing the canal. Steele, Czerny and Risel first sutured the canal by laving it open. We have already called attention to the distinctive features of the methods of Lucas-Championniere, Macewen and Bassini. Kendal Franks has described a method of canal suture in which he uses silver wire. We agree with Barker that silk is the only good suture material for this purpose. A deeply applied multiple silk suture throughout the whole length of the canal fulfills every requirement. For the reason that we have been engaged almost exclusively since 1888 in testing the anatomical conditions in the canal suture for inguinal hernia, we believe that we are justified in placing our suture along side of that of Lucas-Championnière, whose statements concerning the closing of the hernial rings is of a somewhat uncertain nature. Notwithstanding every effort, we have not been able to obtain the treatise by Lucas-Championnière published in 1889, but glean his method from the description of Berger. Judging from a publication by Asderau, it seems that Albert also has operated quite the same as we. It remains to say but a word, how we are able to use the solid canal suture in cases of femoral hernia. The application of the same suture to umbilical hernia is selfevident.

In femoral hernia also, it is necessary to completely isolate the hernial sac serosa, to strongly draw it down, and to tie it as high as possible. With the short and broad pedicle, this is not always so easy as it is in the inguinal hernia. Still more difficult is the suturing of the canal. Nothing is to be gained by sewing the remains of the processus falciformis, which forms the anterior crural ring, to Poupart's ligament; but here also, the deep parts of the femoral canal must be brought together. This is best attained, as we can say after watching the courses which our cases have followed, by passing the sutures through the

transverse portion of the pectineal fascia, which as the ligament of Cooper covers the pectineus muscle at its insertion into the pubis, and drawing it up and firmly suturing it to Poupart's ligament. This causes a broadening of the ligament of Gimbernat, which covers the inner angle of the femoral ring, and usually gives a sufficiently good closure of the hernial opening.

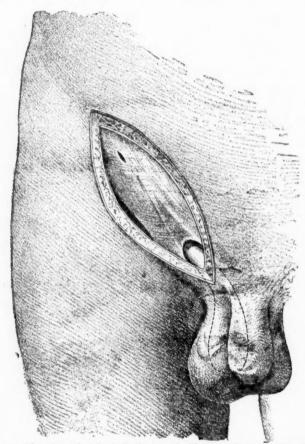


Fig. 1. The primary incision in Kocher's method for the radical cure of hernia.

In closing we wish to describe a new procedure for the radical operation for hernia, which we perfected, and, after sufficient study, performed upon a series of cases and demonstrated before a number of surgeons. For it appears from the not yet completed observations of our final results by Dr. Leuw, that the method

which we had employed has not fulfilled all of our cherished hopes. We have already explained to what degree this view has been modified. This procedure, which, in the literature known to us, has no analogue, is best explained by the accompanying cuts, which were made after drawings by drawing master, Kiener, taking from nature during one of our operations. The method

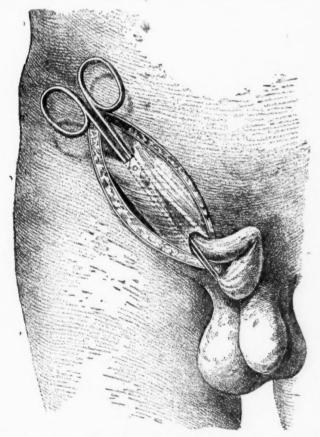


Fig. 2. Forceps introduced along inguinal canal and grasping the sac at its lower end. suffices to make tense the peritoneum in the region of the inguinal canal, and to fix it against the anterior abdominal wall. This is accomplished after the same manner as in the methods of Barker, Ball and Macewen, with the difference that the stretching of the peritoneum is done in a direction opposite to the direction of the inguinal canal and the course of the hernia; and that the fixation

of the peritoneum is done much more firmly, and in a more permanent manner.

The skin and superficial fascia are divided over the inguinal canal and laterally outwards in the direction of Poupart's ligament (Fig. 1.), and the sup. epigastric artery ligated. At the anterior inguinal ring only the thin fascia of Cooper, which, as a

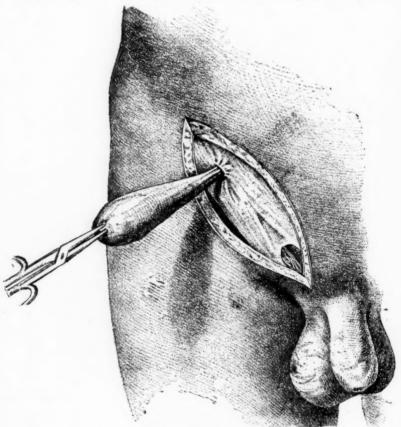
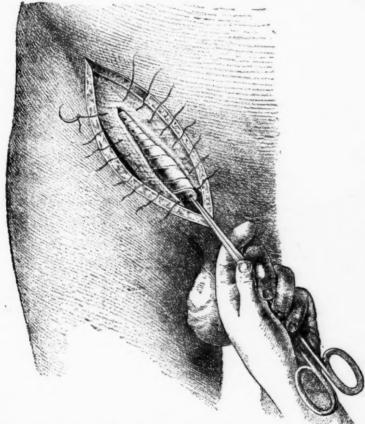


Fig. 3. Sac drawn out through lateral opening in external oblique aponeurosis.

continuation of the tense aponeurosis of the external oblique muscle, covers the spermatic cord, the cremasteric loops and the tunica vaginalis communis, which is especially well developed in hernia, are also divided. The structures of the spermatic cord are now separated, in which, by holding them towards the light, the border of a very thin hernial sac can be recognized. This is

then carefully dissected and isolated from the structures of the cord until it can be strongly drawn down and its pedicle exposed.

The index finger of the left-hand is now introduced into the inguinal canal; and laterally from the posterior inguinal ring, a small opening is made through the aponeurosis of the external oblique muscle (see Fig. 1.). A slender pair of artery forceps is



passed through this opening and through the lower muscular fibers of the internal oblique and transversalis muscles, following the left index finger as it is withdrawn, through the inguinal canal and finally out of the external inguinal opening (see Fig. 2.). With these the isolated hernial sac is grasped and drawn through the inguinal canal and through the narrow opening in its anterior wall—that is in a lateral direction from its upper end.

The hernial sac now hangs through a narrow opening above Poupart's ligament (Fig. 3.). It is drawn out as much as possible, and then, as Heliodorus did, and as Ball has recently advised, it is energetically twisted. The sac is, however, not removed, but strongly drawn down and laid over the outer surface of the aponeurosis of the external oblique muscle against the external inguinal ring, and in the direction of the inguinal canal (Fig. 4.).

By this tension on the sac, as is shown in Fig. 4, the anterior wall of the unopened inguinal canal, and especially the tense aponeurosis of the external oblique muscle, are pressed inwards and backwards into a gutter.

As the twisted sac lies tensely stretched in this manner, beginning at the upper and outer extremity, deep sutures are applied. The sutures are passed above the twisted sac, through the oblique fibers of the aponeurosis of the external oblique muscle and the underlying muscle fibers of the external oblique and transversalis, through the hernial sac itself and including the ligament of Poupart beneath it. These sutures—five to seven or more—bring together also the pillars of the anterior ring, to which the lower end of the hernial sac is fastened. In case of a long sac, all that extends below the external ring is cut away.

In this manner a firm and solid pad or roll is secured over the entire length of the inguinal canal, which forms a better dam against the pressure of the intestines than an implanted patch of skin or periosteum. Furthermore, the peritoneum is drawn laterally on the stretch and firmly pressed to the abdominal wall in the region of the posterior inguinal ring, where it is held by the torsion of the sac and the deep sutures. The operation is more certain when the upper suture can be deeply applied laterally from the place of entrance of the spermatic cord into the abdominal wall.

We have employed the same method in cases of femoral hernial in this manner: The sac, having been completely isolated and twisted as strongly as possible, is drawn through a small opening above Poupart's ligament, and, in the manner above described, included in the sutures which are passed through the pectineal fascia and Poupart's ligament for the purpose of closing the femoral ring.

ON UPWARD DISLOCATIONS OF THE HIP.

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THE following case is interesting and worthy of record as an exceptional form of dislocation, and it may properly be made a text for a few remarks upon the varying mode of production and the classification of a group of dislocations which are often described under one rubric because of the common possession of certain clinical features, although they present distinct pathological differences.

Michael M——, forty years old, was brought by the ambulance to the Chambers St. Hospital from Pier 1, North River, March 10th, 1892, at 1 P. M. He had been found by the Ambulance Surgeon seated on the edge of a chair with his right thigh somewhat abducted and flexed and in marked outward rotation. While engaged in unloading some heavy cases from a truck a case weighing 800 pounds had slipped down upon him and forced him backward against another box and then sideways to the ground. On admission his temperature was normal, surface cool, no complaint of pain except when the right thigh was moved.

When I saw him, three hours later, he was lying on his back with the right thigh extended, slightly abducted, and so far everted that the foot rested along the entire length of its outer border on the bed. The upper anterior portion of the thigh close below the groin was rounded and swollen, and showed two incomplete transverse rents in the skin about two inches long and about two inches below the anterior superior spine of the ilium, which evidently had been caused by over-stretching of the skin. The outward rotation gave the thigh a very peculiar appearance; the bulk of the quadriceps extensor formed a longitudinal mass on the outer side between the anterior (inner) aspect and a deep longitudinal depression extending from the trochanter to the side of the knee. Every attempt to move the limb caused pain and sharp contraction of the muscles.

Ether was administered. The limb could then be easily placed alongside of and parallel with the other; the shortening was two centimetres. The head of the femur lay directly beneath the skin and could be distinctly outlined. It lay just external to a line drawn downward from the anterior superior spinous process, and its upper border was about one inch below that prominence. Internal rotation was impossible; moderate flexion was easy.

Reduction was easily effected by flexing the hip about twenty degrees, and then making moderate traction along its axis with one hand at the knee, and direct pressure downward and backward upon the head of the femur with the other. By fully extending the thigh and making slight pressure forward at the upper part of its posterior aspect the dislocation was easily reproduced, and was then again reduced as before.

Through what was apparently an extensive gap in the soft parts beneath the skin at the point occupied by the head of the femur before reduction I could distinctly feel the surface of the ilium and, a little in front, the anterior inferior spinous process.

A long side splint was applied, and the patient placed in bed.

Convalescence was uneventful, and the patient was discharged, April 15th, 36 days after the accident. May 24th, he called on me; he walked without a cane, and complained only of a slight feeling of weakness in the limb. Hyper-extension of the hip caused no pain; active flexion of the hip was restricted about one-half.

Dislocations in which the head of the femur lies directly above the acetabulum are rare, and the recorded cases are very few. They are commonly grouped under the name of Upward, or Supra-cotyloid, dislocations, in distinction from the other groups of backward, forward, and downward dislocations, but, unlike those other groups, the choice of the name is based upon the position in which the head of the femur comes to rest rather than upon the direction in which it left its socket; and the assumption so commonly found in the reports of the cases or in the description of the group that the primary displacement was directly upward lacks the positive clinical and experimental basis upon which our conceptions of the other forms are built. cerning a considerable number of cases that have from time to time been placed in this group this assumption has been clearly shown to be erroneous. For example, in the everted dorsal dislocation the head of the femur lies above the acetabulum and

the attitude of the limb is that of upward dislocations;—extension, eversion, and more or less abduction; and in some of the suprapubic dislocations, the ilio-pectineal, the head lies above the socket, and the limb has a similar attitude. These two possess the prominent clinical features of upward dislocations, but they are radically different from one another in their essential lesions, their mode of production, and their appropriate treatment; so far as these points are concerned,—and they are the important ones,—each belongs wholly in its own class and should be clearly kept there, in the interest of the patients and of accuracy in classification and description.

Excluding these, there remain very few recorded cases in the class of Upward dislocations, and even these differ so widely from one another in some features that the question of their essential identity cannot escape notice. Of some of them the case herein reported may serve as as a type: the dislocation is produced by the action of great violence, the disability is complete, the limb is fully extended and everted, the head of the femur is distinctly recognizable above and external to the inferior spinous process, reduction is easily effected by traction and direct pressure. In others there is the same eversion, extension, and disability, and the head is distinctly (though less superficially) recognizable on the inner side of the anterior inferior spinous process. In a third group there is abduction, eversion, and some flexion; the patient is able to walk, and the head of the femur cannot be felt. There are only two or three recorded cases of this third group, and the histories are such that the probability of error in the interpretation and diagnosis seems to me so great that I think it would be well to discard them and to await the report of new cases observed with especial attention to this doubt.

Those of the second group, in which the head lies close below and on the inner side of the inferior spinous process, are, in my opinion, cases of extreme secondary displacement outward of primary supra-pubic dislocations. At least I have been unable, in a considerable number of attempts, to produce this form upon the cadaver in any way except by forcing the head out through the upper inner segment of the capsule and then moving it outward by external rotation and adduction.

This would leave only the first group, those in which the head is distinctly recognizable on a level between the two spinous processes and external to both, to demonstrate the existence of a class of upward dislocations. Clinical observation and experiment show that the upper portion of the capsule, including the base of the Y-ligament, is torn, so that, as in the case herein reported, the head of the femur can be slipped in and out of its socket across its upper margin with great ease. It only remains to determine whether the dislocation primarily occurs at that point, or whether the rupture of the Y-ligament is effected secondarily after the head has left the socket in front of or behind the ligament.

In the first of a series of experiments recently made to reproduce this dislocation of the cadaver I forced the head through the upper inner portion of the capsule by extension and outward rotation, and then by prolonging the rotation easily detached the Y-ligament from the ilium and brought the head of the femur to the desired point. For a moment the solution of the problem appeared to have been obtained; but in none of a half dozen repetitions could this detachment be again effected; I could get only an example of the 2d group, the head remained on the inner side of the inferior spinous process.¹

No attempt primarily to rupture the Y-ligament was successful; the only manipulation that held out any hope of doing so was forced extension of the hip, and this was made again and again until the anterior muscles and even the femoral artery were ruptured, but the ligament withstood the strain. When one divides it with the knife and notes its thickness and strength, it seems probable that it would stand a strain better than the femur, that the bone would break before its thick trunk would yield; and I can hardly believe that it could be directly torn by leverage exerted through the femur. Its rupture or its detachment would seem to be possible only by the action of some great force against the back of the upper portion of the partly flexed thigh, a force that would press the head of the femur directly against the posterior surface of the ligament and detach it

¹The first, successful, attempt was made upon a wet preparation of the bones and ligaments that had been kept for some days in a preservative solution; the others were made on fresh or half-dissected cadavers.

successively from below upward instead of all at once. Not being able to develop sufficient force in the dissecting room, I could not put this theory to the test of experiment, except so far as to determine the attitude of the limb after dividing the ligament at its base and passing the head out through the rent. When the rent was simply large enough to permit the passage of the head, the limb could not be made to take the attitude observed clinically, for outward rotation was prevented by the untorn anterior (inner) portion of the capsule; it was necessary in addition to divide that portion before the clinical form could be exactly reproduced.

Experimentally, then, the reproduction of the dislocation either as a primary upward or as a primary ilio-pectineal with extreme secondary outward displacement is extremely difficult, so much so as fully to account for the rarity of the clinical occurrence, and so equally difficult as still to leave the mode of production in doubt.

In conclusion, it may be asserted that there is neither clinical nor experimental proof that the head of the femur has ever been traumatically dislocated across the upper margin of the acetabulum at the point corresponding to the base of the Y-ligament, and that there are very few cases, less than half a dozen, in which it seems probable that it did so leave the socket. Such cases alone should be classed as Upward dislocations, and that only so long as it is not shown that the position has probably been reached by secondary displacement after a primary anterior dislocation.

Those cases in which the head lies above the socket but to the inner side of the anterior inferior spine (in part the subspinous of Bigelow belong by virtue of the primary displacement to the supra-pubic and should be grouped with them.

EDITORIAL ARTICLES.

THE COMPARATIVE VALUE OF TRACHEOTOMY AND INTUBATION FOR THE RELEIF OF ACUTE LARYNGEAL STENOSIS IN CHILDREN.

[The question which is the subject of this article has recently been under discussion at the Academy of Medicine in New York City, and at a meeting of the Medical Society of the county of Kings in Brooklyn. The subjoined observations consist in great part of remarks made by the author in the course of both of these discussions.]

In the vast majority of instances in which acute stenosis of the larynx of sufficient degree to call for operative interference occurs in children, the stenosis is due to the accumulation within the larynx of a diphtheritic exudate. While it is not to be denied that other causes than diphtheria may produce, in rare instances, a laryngitis with pellicular exudate, nevertheless such cases occur so rarely in current experience, that in any general discussion they may be practically ignored. For over thirty years diphtheria has prevailed as an endemic in New York and Brooklyn. Notwithstanding all our recent additions to knowledge, as regards its nature, its propagation and its treatment; notwithstanding the great advances in sanitation which have been made in these cities during the period in question, diphtheria still remains as one of the chief causes of death in these cities. In the city of Brooklyn, during the three months immediately preceding the preparation of this paper, 129 deaths from diphtheria were reported. The mortality from the same disease in New York is about twice that of Brooklyn. With such a widespread continuous dissemination of the diphtheritic poison in these communities, it is, therefore, impossible in any given case of exudative laryngitis to absolutely exclude diphtheritic infection. Abundant personal clinical observation has often demonstrated to me that the symptoms tabulated by systematic writers for establishing a differential diagnosis between diphtheritic and non-diphtheritic laryngitis are entirely unreliable and their importance quite imaginary. It has again and again occurred to me to see children who have rapidly developed extreme laryngeal stenosis without any preceding or concomitant symptoms of diphtheria, but in whom, their lives having been prolonged by tracheotomy, the development of all the general and local signs of diphtheria became pronounced. Had the stenosis been unrelieved these cases would all have died without ever having developed the ordinary symptoms of diphtheria. For more than fifteen years, therefore, I have claimed and taught that every case of exudative laryngitis is presumably diphtheritic in its character, and that all cases should, from the first, receive the treatment appropriate to the diphtheritic condition.

This relation of diphtheria to acute laryngeal stenosis in children is emphasized because a recognition of their identity is a point of prime importance in influencing a choice as to operative measures for the relief of the stenosis. The laryngeal obstruction is but a part of a general infective disease, the effects of which are to be guarded against while the immediate local emergency is provided for. This, therefore, is the touchstone which I would use in determining the relative merit of the two procedures under discussion. Granted that both equally relieve this stenosis of the larynx, which of the two is best adapted to assist the system in its struggles against the general infection by which it is threatened?

The answer to this question involves the three points, of blood æration, of general nutrition, and of local cleansing or antisepsis.

I. Blood Aeration.—Abundant experience has shown that the intra-laryngeal tubes of O'Dwyer will usually admit with sufficient freedom all the air required for the purposes of respiration. Further, all the air which passes through it into the trachea is necessarily warm and moist, so that there is less danger of the accumulation within the trachea below it of clumps of inspissated secretion that may block it up, while also the narrowness of its lumen increases the expulsive force of the cough, as long as the lumen remains unobstructed. For the escape of membranous masses of any size from the trachea, it is not well adapted. In a very considerable proportion of cases of acute

laryngeal stenosis the presence of such masses within the trachea complicates the later course of the case and, not unfrequently, determines crises of great intensity as they become detached. Unfortunately, as long as the primary symptoms of acute stenosis dominate the scene, there is no means whereby a judgment can be formed as to the later presence or absence of such a complication, so that the judicious surgeon would, in all cases, be led to choose, other things being equal, that method of relief which would enable him the most readily to cope with this complication should it arise.

Such a crisis may also arise at the very moment of the introduction of the intra-laryngeal tube since masses of the exudate may be stripped up by it and pushed before it as it is introduced, sufficiently to immediately and absolutely block the trachea. That this danger is not merely theoretical is attested by many published cases in which immediate death has followed the introduction of the tube. It has been usual to say that in such cases tracheotomy still remains as a possible resource by means of which the patient may yet be rescued from death. Practically, however, this not so. It is too late for tracheotomy. The fatal result can rarely be averted, when this accident has occurred, by the opening of the trachea, however expeditiously it may be done. At this juncture it may not be amiss to call attention to the fact that, in general, trecheotomy done as a secondary resort, in cases which have been primarily intubated, has proven itself a very unsatisfactory procedure; the proportion of ultimate recoveries secured by it having been very small. Thus, of eighteen such cases subjected to secondary tracheotomy in the service of Thiersch at Leipzig, 1886, all died (Urban, Annals of Surgery, 1890, XII. p. 362); and of fifty-seven such cases operated on in the Boston City Hospital (Lovett, Annals of Surgery, 1892, XVI. 369), fifty-two died. When these results are compared with the average results which attend primary tracheotomy-28 per cent. of recoveries-it is seen that the patients who, after having been intubated, develop later renewed dyspnœa calling for relief, form what may be called a selected class of bad cases in which operative interference of any kind promises but little. Still in a small proportion of cases tracheotomy may still succeed in preserving life. Nevertheless the surgeon who is choosing a means of relief for acute diphtheritic laryngeal stenosis must realize that he practically has but one opportunity of choice. Remembering this, and being awake to the possible requirements for the ready escape of exfoliating membrane later in the course of the case, most surgeons will feel it their duty to freely open the trachea from without at some point below the isthmus of the thyroid gland.

III. Local Cleansing or Antisepsis.—In diphtheria of the fauces, pharynx and nares the importance of local cleansing and antisepsis is well recognized; much of therapeutic effort is very properly directed toward preventing the accumulation of infective material in the affected localities and thus diminishing the septicæmia resulting from absorption of the products of its decomposition. A further danger of systemic infection exists in the fact that the inspired air must become more or less charged with offensive and septic material, if adequate disinfection of the upper respiratory tract is neglected, and thus a foul and contaminated air be continuously supplied to the air cells below, with, in not a few cases, the additional burden of infective material of sufficient virulence to kindle septic inflammation of the lung tissue itself.

Whatever is true of the nares, and fauces and pharynx in respect of local sepsis is equally true of the larynx and trachea when the seat of the diphtheritic exudate. The surgeon who is in the habit of opening the trachea in these cases has many opportunities of seeing the accumulations of pultaceous material muco-pus and membranous debris, that form within the trachea and contaminate the respiratory current. One of the marked advantages that attends properly performed tracheotomy is the ready removal of this material, which often abundantly wells forth as soon as the trachea is incised. In the after days of such a case the ready escape of tracheal and bronchial secretions is facilitated by the external incision, and by the use of a tube with as large a lumen as the size of the trachea will easily Through this tube the easy ingress to the lungs of abundant pure air also is assured, which may be warmed and moistened according to the judgment of the attendant. The air may be medicated by sprays or by admixture with oxygen gas; the tracheal mucous membrane may be treated by instillations of medicated liquids or may be swabbed out with proper sponges if need be. These opportunities and advantages are not imaginary nor exceptional, but they are all of positive value, and of frequent resort to the surgeon who is fully equipped and ready for his work. They are of sufficient value in many cases, I am persuaded, to turn the trembling scale of fate toward life instead of death, and therefore, are ever to be given serious consideration when a choice is to be made of an operative attempt to relieve acute laryngeal stenosis of diphtheritic origin. They must all be sacrificed if intubation is chosen.

III. General Nutrition.—Laryngeal diphtheria differs in no respect from other forms of diphtheria in the importance which attaches to feeding and stimulation in its management. The difficulties which attend the administration of proper food and stimulus are often great at best; the presence of a rigid metallic tube in the larynx, with its enlarged upper extremity projecting at the base of the epiglottis would presumably interfere still more with deglutition-According to O'Dwyer (Ref. Handbook Med. Sci. IV, p. 420, Art. "Intubation ")-if the mobility of the epiglottis be very much crippled by inflammatory thickening, and the deposit of pseudo-membrane the deglutition of fluids will be difficult with any form of tube in the larynx; if, on the contrary, the epiglottis be comparatively healthy, which is not uncommon, fluids will be swallowed with much greater ease. As a rule when intubated patients can be induced to take solid or semi-solid food, it is swallowed with comparative ease from the beginning and the ability to swallow fluids increases with time. This perhaps is the most favorable presentation of the relations of intubation to deglutition that can be made, and I have taken pleasure in giving it in the words of the author of the procedure. If I can form an opinion from the published experience in intubation that has come to my knowledge, I should judge that it is somewhat optimistic, and that in general the embarrassments of deglutition that attend the presence of a tube in the larynx are quite serious, and that they often form a decided difficulty in the after management of an intubated case. Certainly, difficulty of deglutition is a sufficiently pronounced and direct result of intubation to require to be fully taken into account by the surgeon when forming his judgment as to the procedure which will best enable him to avert the dangers of diphtheria of the larynx.

On the other hand deglutition is not interfered with by the presence of a canula in the trachea, introduced through an external incision.

In each of the three important particulars that have thus been rapidly reviewed, viz:—blood æration, local antisepsis, and general nutrition, it has seemed to appear that in each, important advantages in cases of acute diphtheritic stenosis of the larynx attach to the use of tubes inserted from without into the trachea through a wound in the neck over the use of tubes inserted in the larynx through the mouth and pharynx.

Fully realizing that it is quite possible for one, who has become prepossessed by the claims of one line of procedure, to be unable to give sufficient weight to the merits of a different procedure. I have for some years been waiting for the verdict which the accumulated experience of many workers might give as to whether the apparent advantages of tracheotomy which I have enumerated were imaginary or real. If, as the result of actual practice, intubation is found to secure as large a proportion of recoveries as have resulted by the older and bloody method, then the theoretical objections must be acknowledged as of no weight. It is difficult, however, to make a a proper comparison of results owing to the possibilities of differences in the character of the cases submitted to two different procedures. It is undeniable that intubation is much more likely to be resorted to in cases of less critical nature than would be tracheotomy. The suspicion of this fact is likely to vitiate for purposes of comparison all the general statistics that may be accumulated as to the results of intubation. I accept without question, however, the statistics of O'Dwyer, who states that he has only resorted to intubation as a last resort in cases which he was convinced would die if not relieved. Limiting himself to such cases, he wrote in 1888 that nevertheless his recoveries amounted to twenty-four per cent. of the cases operated. Less favorable, however, has been the experience of the surgeons of the Boston City Hospital who, out of 392 cases that were intubated, secured 20.41 per cent. of recoveries. Less favorable yet was the Leipsic

experience, where out of thirty-two cases of intubation but three recovered.

These results are decidedly less favorable than those which have hitherto been secured by tracheotomy. In 1887 Lovett and Munroe compiled from all sources, excluding groups less than five in number, 21,853 cases of tracheotomy for croup, of whom 6,135 recovered, that is to say, 28 per cent. My own personal statistic gives a better result yet, since out of sixty-six tracheotomies for diphtheritic croup, in all of which operation was resorted to only when the stenosis had become extreme, twenty-two recoveries have been secured—thirty-three and one-third per cent.

On the other hand one of my neighbors in the city of Brooklyn, Dr. McNaughton, within four years has subjected 142 cases to intubation, of which 42, or 29.5 per cent. have recovered. Dr. O'Dwyer in the Academy of Medicine discussion, stated that out of his second and third hundred of intubation cases, 57 had recovered, a percentage of 28.5. One-fourth of these cases were under two years of age. The statistical argument becomes very much mixed by reason of such varying results. No reliable conclusion can be drawn from them as to the comparative merits of the different procedures, and one is driven back to that much more satisfactory ground for judgment to be found in a careful study into the pathological conditions to be combatted, the vital indications presented in individual cases, and the relative perfection with which a proposed procedure will meet the one and fulfill the other. The more important points to be considered in such a study I have already passed in review. The conclusion seems to me to be a just one: that intubation answers the indications for surgical interference when a diptheritic exudate has formed within the larynx and trachea much less perfectly than does tracheotomy, and that therefore, as a rule, it should not be considered as a substitute for tracheotomy in such cases. I do not wish to gloss over in any degree the peculiar dangers and disadvantages that attach to tracheotomy. They have been thoroughly studied; they are well understood; in the great majority of cases they can be overcome. He who attempts the operation should have operative skill and familiarity with his tools; coolness, judgment and anatomical knowledge are essential;

there is a tube to be kept clean; there is a wound to be taken care of; the respiratory short circuit that has been established demands special precautions to make it harmless; the pressure effects of long retained cannulæ are to be guarded against, and in some cases granulomata or disorders of the laryngeal muscles render difficult the final suppression of the tube. These are all open, plainly declared difficulties, which, if recognized and provided against, can be reduced to such a minimum as regards their prejudicial effects, as to be rendered of but little weight by the side of the great advantages in other respects which the external incision offers,

To what extent has intubation supplanted tracheotomy? Evidently to a very considerable extent during the past few years in this country. The natural shrinking which mankind in general, including even members of the medical profession, as a rule, have to the infliction of surgical wounds has in the past and will always continue to make the operation of tracheotomy the last resort which will be accepted for the relief of croup, except in institutions organized upon a surgical basis in which the operation is established as a matter of routine. In general I am persuaded that in future the very considerable prospect of relief and ultimate recovery which intubation can promise, although distinctly inferior to that held out by tracheotomy, will cause the non-bloody procedure to be often chosen, the aversion to the surgical wound being the controlling reason for making the choice. A larger proportion of cases will receive operative help of some kind, and many lives will for that reason be saved, which, if the bloody operation were the only recourse, would otherwise have been allowed to perish. This is well illustrated by our Brooklyn experience. In this city I believe that it has been my lot to be called upon to do tracheotomy for the relief of croup in a considerable proportion of the cases that have sought surgical relief, and yet, during a period of seventeen years during which I have been operating, I have been called upon to do the operation but sixty-six times, notwithstanding the deaths from croup in our city during this period have amounted to between four and five hundred every year during the same time. On the other hand during the past four years, my neighbor, Dr. McNaughton, has been called upon to intubate 142 times. He has been instrumental in

saving 42 lives in four years; I but 22 in seventeen years, notwithstanding 33½ per cent. of my cases recovered, and but 29¾ per cent. of his.

A very large proportion of croup cases occur among people whose home conditions are such as to make it impossible for the peculiar cares which tracheotomy requires to be adequately given to the sufferer. Such cases, if they must be treated at home, have a better chance if subjected to intubation. Again, in general practice, all patients can not command the skilled surgical attendance which is required if the full benefits of tracheotomy are to be realized. If one skilled in intubation is accessible for such a patient, intubation should be preferred.

The positive advantages which attach to tracheotomy over intubation, when the adjuncts required to obtain the full benefits of tracheotomy are available, are so great that I venture to urge now the importance, since diphtheria may be expected to continue to prevail in all large cities indefinitely, of providing and fully equipping at conveniently placed stations in cities, preferably in connection with already existing hospitals, isolated wards for the special reception and care of patients suffering from laryngeal diphtheria. Such croup pavilions should be maintained at the public expense, just as, in some cities, ambulances are at present, while the responsibily of manning and directing the work in them should be delegated to the hospitals in connection with which they are established. These pavilions should command the confidence of the medical profession and of the public, and to them should at once be brought every child who develops laryngeal diphtheria, whose home conditions are not such as to enable him to command every possible resource for relief. It is not too much to hope that, if such a plan was adopted in New York City and Brooklyn, a very considerable proportion of the 1500 or more deaths from croup which occur annually in these cities would be averted. I am inclined to think, also, that in such properly organized and adequately equipped institutions, tracheotomy would prove to be more efficient in saving life than would intubation, and that therefore, in such institutions in which in the future the care of cases of acute laryneal stenosis is largely to be conducted, tracheotomy will not be supplanted by intubation, as the expedient most generally resorted to for its relief.

LEWIS S. PILCHER.

CEREBRAL SURGERY AT THE LAST CONGRESS OF ITALIAN SURGEONS 1

The most important paper of the series was upon "A New Method of Determining Cranio-Encephalic Topography," by Dr. D'ANTONA. In this it is stated that the two most precise osseous points at the base of the skull are the lower orbital margin and the auditory canal, especially the latter. They are readily found and being bony points are in close relation to the development of the skull. The auditory duct in particular is less subject to change independent of the skull.

A line drawn from the lower orbital margin to the center of the auditory canal is the most rational and fixed base that can be obtained for determining the topography. From this line a vertical line is drawn from the center of the auditory duct at right angles to the base line: this forms a true bi-auricular line. In order that the two orbito-auricular lines may form a perfect right angle it is best to employ two threads and a carpenter's square, or a visiting card that has been accurately squared beforehand.

The true vertical bi-auricular line having been traced the key is at hand for the localization of all the principle surgical points in the brain. The fissure of Rolando crosses this vertical line at an angle of 20 to 25°.

The lower temporal fissure is on this vertical line 3 cm. from the center of the auditory canal; the upper (parallel) temporal fissure, between the second temporal convolution below and the first above, is distant $4\frac{1}{2}$ cm.

The fissure of Sylvius is on this line 6 cm. from its starting point, somewhat in front of the point where the post Rolandic sulcus inserts into the Sylvian. From this point a transverse line is drawn at a right angle to the vertical bi-auricular, and parallel with the orbito-auricular line.

The lower angle of the fissure of Rolando is crossed by this second horizontal line 12 mm. from its starting point; 35 mm. further on the same line crosses the posterior foot of the third frontal convolution. The upper extremity of the fissure of Rolando is 12 mm. behind

¹Arch. ed Atti della Soc. Ital. di Chirurgia, 1892.

the vertical bi-auricular line, 1 cm. before this line crosses the sagittal suture. The parieto-occipital fissure is 5 cm. behind the upper point of the fissure of Rolando and parallel to the sagittal suture.

For the direction of the fissure of Sylvius it is necessary to draw a line intersecting the bi-auricular 6 cm. above the auditory canal and proceeding obliquely to the vertical (angle of 75°) 4 cm. backward, and upward and 50cm. forward and downward. The upper branch of the Sylvian fissure separates from the other arm 20 mm. from its extreme anterior point and runs in a line 30° from the vertical. The whole parietal lobe is along and above the posterior Sylvian tract. The first portion forms the upper Sylvian margin behind the Rolandoic zone, being crossed here by the vertical line. Its middle portion (lobule of the angular gyrus) passes along the rest of the Sylvian fissure and around its extremity to blend with the first temporal. The third (posterior and inferior) portion (the angular gyrus) proceeds from the second portion, runs behind the posterior extremity of the parallel fissure and continues with the extreme posterior portion of the second temporal.

DR. POTEMPSKI contributed an article on the Surgery of the Brain and Cerebellum, consisting of the reports of, first, a case of endocranial tumor in a woman who had a right brachial monoplegia, with vague pains and attacks of Jacksonian brachio-facial epilepsy followed by a permanent, but slight, facial and hypoglossal paresis. There were changes in her general nutrition, diminution of intelligence and pain in the cranium, which had begun ten years before. The diagnosis was a small endocranial tumor compressing the cortex near the middle of the fissure of Rolando.

This fissure having been localized the skull was opened. The dura revealed nothing abnormal except that at the lower margin of the opening the tension seemed greater than normal. The bony opening was then enlarged and the dura opened. A tumor of the size of a pigeon's egg was discovered and readily enucleated by the finger. There was so much hemorrhage that it was necessary to pack the wound. The next day there was complete right hemiplegia. Within forty-eight hours the tampon was removed. Complete recovery, excepting a slight hypertrophy of the left limb, followed.

The tumor was pediculated, had a smooth surface to which small portions of membrane adhered and was an alveolar sarcoma (Ziegler).

The second case was a tumor of the cerebellum in a patient twenty-two years of age who had intense headache for two months, the pain subsequently radiating into the vertebral column and finally producing impaired power of locomotion. There was also difficulty in pronunciation and in vision, slight fever and vomiting. There was a small superficial scar on the head caused by a blow from a stone, There was also slight ptosis of the upper left eyelid, slight strabismus, very evident nystagmus, normal field of vision and normal hearing. He also had a slight facial paresis, normal deglutition, tongue tremulous and deviated slightly to the right. Could not stand well and moved with difficulty. No atrophy of arms. Muscular strength and excitability normal, no fibrillary movements. Reflexes, abdominal and cremasteric abolished, patellar prompt, plantar wanting; urine normal. An incision was made 3 cm. horizontally from the apex of the mastoid and r cm. from the occipital protuberance. The sterno-mastoid, trapezius, and complexus muscles were reflected and the periosteum detached and the skull opened. The dura was normal but much distended, the surface of the cerebellum showed a tendency to rupture when the dura was opened and as soon as the meninges were incised a large quantity of cephalo-rachidean fluid escaped. The hemisphere then shrunk until it appeared much smaller than normal.

Digital exploration was made of the whole left side of the cerebellum, but nothing was made out, as hemorrhage had become troublesome, so the cavity was washed out with a sublimate solution and tamponed with iodoform gauze. On the third day the tampon was replaced by a celluloid plate closing the cranial cavity with the exception of a hole left for drainage at the lower angle. The soft parts were sutured over the celluloid plate, but this became displaced and it was necessary to open the wound again in order to remove it. No benefit resulted from this operation and two months later he was subjected to the same manipulation on the right side. A quantity of cerebro-spinal fluid, less than the former amount, escaped this time. The surface of the cerebellum was apparently healthy and the hemisphere sank as the fluid escaped. Palpation with the index-finger

revealed a greater consistency of the head of the vermiform process; its surface was not smooth but was unequal. On turning the finger around some connective laminæ were lacerated. The presence of a tumor seemed doubtful and further surgical procedures being impossible the wound was tamponed. The patient was improved after the operation so far as the co-ordinate movements of the upper limbs were concerned. The nystagmus disappeared, the cremasteric and abdominal reflexes returned, the facial paresis was overcome, the patient being able to blow out his cheeks; the tongue lost its deviation from the proper line and its tremulousness, but the lower limbs did not improve.

The third case, one of microcephalus in a child thirteen months old, was operated upon by an incision from the fronto-parietal to the occipito-parietal suture. Periosteum reflected and an ellipse of bone as long as the incision and 6 mm. wide was removed. A large vein was accidentally injured, causing a copious hemorrhage which necessitated foregoing further operative manipulation. The contractions from which the patient had suffered prior to the operation improved gradually. It is proposed to operate again.

The fourth and final case was one of cortical epilepsy in a young man of twenty-four, who had daily convulsions with cyanosis of the face and other symptoms lasting about a minute. The trouble having been localized in the cortico-motor centres for the upper and lower limbs, an incision was made and the cranium opened to an extent of $4 \times 2\frac{1}{2}$ cm. near Rolando's fissure. The diploe was wanting in this portion of the skull, but the dura appeared healthy. Heat (60°C.) placed in contact with the dura caused excitement, first of the opposed limbs then of all four, and then of the right limbs as in one of his attacks. This patient was apparently worse after the operation and is to be operated upon again when it is proposed to excise the cortex after the method of Horsley.

Dr. Casselli also reported four cases of traumatic epilepsy. The first a boy of seventeen years who had been injured when seven years of age, and who had cortical epilepsy localized over the whole right motor zone and especially at the base of the ascending frontal convolution. His attacks came on every ten days (fifteen days in summer) when

he is suddenly seized with intense vertigo, screams and falls. He loses consciousness and remains in this condition for two hours. On recovery has nausea, intense headache lasting half an hour and is excitable, exacting and threatening, often taciturn, reserved and walks up and down the room paying no attention to company. Has a ravenous appetite and eats voraciously of the coarsest food. There is hemi-paresis of the muscles of the left half of his face. In the right parietal region there are two linear scars, nearly parallel and about 3 cm. apart, running obliquely downward and forward. Inspection and palpation reveal a depression corresponding to these scars.

In operating care was taken to ascertain the vertex capitis by means of the bi-auricular line, the extreme point of the fissure of Rolando, being 48 mm. behind the vertex. An incision 15 cm. long was made in the right parietal region and a flap turned down. This flap did not include the periosteum. All hemorrhage having been arrested a circular incision was made in the periosteum and a trephine of 4 cm. diameter removed a button of bone on the internal face of which there was a fissure, evidently the remains of an old fracture. Two bony fragments one above the other were also removed. The internal surface and margins of the disc having been smoothed off it was immersed in a 1-2000 solution of sublimate at 40°. Eleven small pieces of bone were removed with Hoffman's forceps.

Palpation of the dura mater revealed a softened area which was suspicious of, but not diagnostic of, fluctuation. An aspiration with a Pravaz syringe revealed only subarachnoid fluid. The bony disc was replaced, the periosteum reunited with catgut sutures and the cutaneomuscular structures with silk.

There were no after complications. Pulsation continued in the operated region for twelve days, but the wound healed by first intention. In twenty-four hours improvement was noted and the patient remained under observation for six months and had only two slight attacks, his general health improved steadily.

The second case was one of cortical epilepsy of traumatic origin in a woman, twenty-five years of age, who was struck, when seven years old, in the right parietal region, a wooden peg remaining imbedded in the cranial cavity for some minutes. Immediately following the accident she experienced a pricking sensation which has never disappeared. Her first attack of epilepsy occurred two years later and she had recurrences of varying severity every four or five months until finally they became more frequent and of longer duration. Examination revealed a depressed scar about 3 cm. from the sagittal suture apparently without bone between it and the brain. Following the direction of the right fissure of Rolando a large incision was made and the break in the bony vault was laid bare. This was enlarged and some fibrous tissue adhering to the dura was removed. The thermo cautery not controlling the hemorrhage satisfactorily, the wound was packed with gauze saturated in an antiseptic solution of cocaine and the flap sutured. No convulsions were observed during the next six months.

The third case was also a woman, nineteen years of age, with traumatic epilepsy localized in the motor center of the left side. Ten years before she had received a severe contusion over the occiput. Her first convulsion occurred four years later. The dura was found distended and adherent to the cranial vault corresponding to the lower part of the motor zone.

Incision of the dura revealed five miliary nodules under the arachnoid. On opening this latter membrane a quantity of sero-fibrinous fluid escaped (circumscribed leptomeningitis). The patient had infrequent and slight attacks during the following four months. The fourth case, a woman, twenty-one years old, received a traumatism during infancy. She had frequent epileptic attacks localized in the right motor zone. Four oval osseous plates about 8 mm. wide and 12 long were found pressing on the dura and removed. During the next four months there were no attacks.

DR. TAUSSINI also reported a case of *trephining for epilepsy* in a man who had his first attack when eighteen years old. This patient had a marked asymmetry of the skull, which was characterized by an increased height in the frontal bone on the right side; on the left there was a depression.

A projection was also present on the right which corresponded to the coronal suture. Behind the raised portion of the bone there was a transverse furrow about 6 cm. long in which distinct pulsations were seen.

This furrow was laid bare and it was found to be a fissure in the skull about 6 cm. in length and 1 cm. in width, extending to the median line. Its margins, particularly the posterior one were irregular.

The anterior margin having been smoothed off with a scalpel, the bone was divided with a saw, about 11/2 cm. behind the posterior margin of the fissure and parallel with it. Thus a strip of bone, about 5 cm. long and 1 cm. wide, was removed together with a disc (of about 2 cm. in diameter) by the use of a trephine near the median line at the innermost (or uppermost) part of the incision. The bone being markedly thicker than normal, and the dura mater very adherent, a second disc was removed close to the first, but then the bone seemed nearer the normal thickness and the adhesions were very slight. The dura mater, though thickened, was lacerated, but there was very little hemorrhage. The cerebral surface presented no alterations, except a congested state of the pia mater. The large gap was plugged with iodoform gauze and the wound closed. During the five months following the operation, the patient remained well, and became docile and quiet. Some slight but very short attacks were followed by their complete disappearance. None were observed for two months.

DR. CECI reported a case of craniotomy in hemiplegia due to cortical compression.—The patient, a sea-captain, who had been accidentally wounded by a sailor's cutlass, both in the head and the metacarpal phalanx of his left thumb, was athletic in appearance, and the muscles on the healthy side were well developed and strong. There was loss of voluntary movements in the left half of the body (less complete in the lower limbs). The muscles of the left half of the face, tongue, uvula, shoulder and throat and the upper limbs were completely paralyzed. Contracture of fore-arm and hand, the muscles showing fibrillary contractions. The fingers were bent on the hand, the thumb lying below the other fingers. Pupils the same on both sides, but the left iris contracted more slowly than the right. The sensibity in the paralyzed parts was nearly normal. The patient was short-sighted and used spectacles; he read equally well and at the same distance with both eyes. Veins of pupils somewhat dilated.

He heard the ticking of the watch at 40 cm. on the right, and at 20 on the left. Noticed smells equally well with both nostrils. Taste normal except at tip of tongue. Speech notably affected.

There were observed in the parietal region:

Ist. A linear scar 6 cm. in length, beginning in the sagittal line, I cm. in front of the vertex capitis and running at an angle of 40° from that line corresponding closely to the fissure of Rolando, found and marked on the head by Championniere's method. 2d. A second scar outside of the first at a distance of 13 mm., parallel to it and 3 cm. in length. 3d. A third scar, beginning at 15 mm. behind the vertex, making an angle of 12° with the sagittal line, and running 4 cm. posteriorly. 4th. A mass of granulations of elliptical shape outlined by scar-tissue on its borders. From the upper half of the wound a necrosed fragment of bone extruded. The fragment appeared to be immovable and was surrounded by granulation-tissue, running downward for a distance of 2 cm. and the width of 12 mm. Two swellings in the right parietal region were also observed, the posterior pulsating, the anterior very hard. A furrow between these two swellings corresponded to Rolando's line.

At the beginning of the anæsthetization, contractions were noticed in the paralyzed side of the face. The patient became cyanotic and breathed very badly whenever complete anæsthesia was attempted. An incision, starting from the upper part of the wound and running along the upper limit of the two swellings was made. The fragment of bone-necrotic in its exposed portion was connected with the living bone, and bent toward the anterior and superior portion of the parietal region. The incision, circumscribed both the hard bony and the pulsating swellings, anteriorly and downward, thus forming a quadrangled flap with its base in the pulsating swelling. In detaching the borders of the upper part of the incision from the skull, there was observed diverse lines of fracture of the parietal bone which appeared divided into multiple fragments, all firmly united with fibrous callus. The superior, anterior and inferior sides of the osseous part were cut with a scalpel. With two divergent superior incisions a median flap and two lateral ones were made. With an inferior-posterior incision, beginning from the

inferior-posterior part of the ulcer, two lateral flaps were also formed. The injured parietal region was thus amply exposed.

It was found that the bony fragment, issuing posteriorly was deeply depressed, and there existed above it two other fragments, the one (posterior and superior) being inclined forward and the other on a normal level. It was necessary to remove with the scalpel the anterior and superior fragment in order to tear out the pieces below it. This fragment formed part of the sagittal suture.

All the sunken fragments having been removed, there remained an osseous gap, whose greatest diameter was 12 cm. The compression caused by the depression and the superposition of fragments over the entire cortical motor zone being obviously sufficient by itself to account for the hemiplegia, all the incisions were carefully disinfected and sutured after the complete removal of every compression of the dura.

Progress after operation nearly apyretic. Highest temperature 37.9° on 4th day, and 38° on 5th day. Healing of wound per primam.

Noticeable improvement of left lower limb after the 4th day, voluntary movements increasing from day to day. After two weeks, the patient could flex the thigh on the body and leg to the thigh in an acute angle. Movements of the shoulder and arms appeared. Increased sensibility. Faradisation of muscles of the left half of his body on the 16th day. The patient was able, on the 20th day, to rise from bed with the assistance of the nurse. But contractions reoccurred first in the shoulder and then in the arm. The patient was very intolerant and would laugh loudly on the slightest provocation.

Another operation was proposed for the purpose of opening the meninges, exploring the brain and removing the cicatricial meninges which probably adhered to the convolutions. The existence of suppuration in the wound prevented incision into the dura mater, and the patient refused to submit to another operation and left the hospital. He was able, however, to go up the stairs and to walk about by the aid of a nurse.

After a month he returned to undergo a second operation, for complete cure. But his surprising improvement, and the fact that the cerebral pulsations in the place of the lost osseous substance showed that there was no longer cerebral compression, contra-indicated another operation. He walked with a cane. There was slight facial paresis; tongue and uvula slightly deviated to one side. Movements of shoulder strong and complete. He moved his arm pretty well, forearm not so well, the hand still less, and least of all the fingers. Movements of the muscles of the thigh stronger and fuller than those of the leg. Extensor-muscles over the whole side more energetic than the flexor-muscles. Contractures less frequent and of shorter duration. The right parietal region (the field of operation) was considerably depressed, respiratory movements and pulsation visible in its middle and lower part; they increased during muscular-efforts, and especially when coughing.

SAMUEL LLOYD.

CHIPAULT ON THE SURGERY OF THE SPINAL CORD.

During the past two or three years Chipault has contributed to the French periodicals a series of articles which are worthy of careful study on the part of those who are especially interested in the surgery of the spine. ¹

In the last of this series of articles he draws conclusions from all those that have preceded it and amends and adds to the statements formerly made. This paper is not accompanied by any tabulation of cases, but is rather a resume of all the work that has been done up to the present time.

As a result of this study Chipault makes the statement that "surgeons in attacking the spine and the cord have never done a sufficiently large and complete operation," this is the deduction he reached after his observations in the dissecting rooms.

When, however, he had tabulated all the cases and had himself operated several times he says, as a result of these observations, "the indications for interference are rare, very rare," and finally he adds

¹Gazette des Hopitaux, 1890, pp. 809, 969, 981, Archives Generales de Medicine, VII. Series 1890, V. II, pp. 444, 560, 676; Révue de Chirurgie, Oct., Nov., and Dec., 1890; Révue de Chirurgie, Nov., 1891; Révue de Chirurgie, August, 1892.

that "at least we have the satisfaction of understanding better and outlining the diagnosis of the levels of the lesions of the spinal cord, which until now were imperfectly recognized."

In giving the synopsis of the different terms suggested for the operation he has omitted the one published I think by Mr. Davis-Colley in the London Lancet, rachiotomy.

The first point discussed is the technique of the method of exposing the posterior surface of the spinal cord. The different incisions through the skin and soft parts are detailed and it is stated "that it is necessary to firmly fix the skin before incising it, because, at least in Pott's disease, the presence of subcutaneous serous bursæ allow it to readily slip upon the spinous processes. The abundant venous hemorrhage should be arrested by patient compression of the wound before attacking the bone. Sometimes this part of the operation is complicated by a fresh bleeding coming from the spongy tissue and some arterioles. Hemorrhage has no especial interest in the lumbar or dorsal regions, but is much more serious in the neck since three times death has resulted in this region in consequence of a lesion of the vertebral artery.

Chipault advocates the removal of the bone with the cutting bone forceps of Mathieu. The periosteum should always be preserved for since M. Ollier has demonstrated on dogs that after a subperiosteal resection of the bone a very good osseous canal is reproduced Chipault has remarked that in five children upon whom he had operated the same result was manifest. (Upon three this was determined by palpation, but the other two were examined post-mortem.)

"The surgical rule should be to have a large bony opening, even very large, long and large."

It is now considered advisable to open the dura in all cases, but Chipault thinks that "where there is a tubercular peripachymeningitis, unless there is a co-existing tubercular lesion of the pia mater, it might cause a tubercular meningeal infection and is not necessary; where there is an extra dural tumor it is equally useless, but where there is a traumatism on the contrary it is always indicated."

"There is one sign which indicates the integrity of the meninges, i. e., the motion in the dura depending upon the pulse and respiration.

The absence of this indicates an intra-meningeal tumor, or a ring of adhesions between the membranes and the cord shutting off the circulation of the cerebro-spinal fluid." This pulsation is not present when the membranes have been the seat of a pathological compression either from without or within but it returns in a few minutes after its removal if it has not been too prolonged or too intense. This return of the pulsation is a good sign. If it does not reappear it is because the compression has produced some intra-meningeal lesion which should be explored.

Chipault has also, on the cadaver in two cases of fracture of the spine with a complete section of the spine experimented to determine the possibility of bringing the several ends of the cord into apposition and securing union of the segments, the possibility of which procedure has been suggested by Maydl, Duncan, Morris and Abbe, but they have all found the undertaking impossible. So Chipault in these post-mortem cases found that the retraction of the medullary segments and the extent of the sclerosis necessitated the resection of several centimeters after which the lack of elasticity of the cord and the resistance of the ligaments of the pia mater oppose the approach of the healthy ends. On the contrary, where a recent section has been made by a cutting instrument, suture of the cord which is in reality only a suture of the membranes is possible on the cadaver and undoubtedly equally possible in the living subject.

Second.—Puncture of the lumbar vertebra was first practiced by Essex Wynter and then by Quincke. A trocar and canula are plunged, after an incision of the skin or a resection of an arch through the dura in the third or fourth lumbar space. The trocar is then withdrawn and a rubber tube is attached to the canula and the free end of the tube is inserted into the glass for the reception of the fluid. This trocar measures from 0.6 to 1.2 millimeters in diameter. After the removal of the trocar the wound is dressed with iodoform-collodion and bandages, and rest in bed should be enjoined. When it is desired to have the opening in the membrane remain patent for a longer time a bistoury may be employed and a longitudinal incision may be made. With an incision 4 millimeters long the opening remained patulous for eight days.

Anæsthesia which is not necessary in lumbar puncture and needs no special consideration in Treves' operation ought to be when laminectomy is performed very profound at the moment of incising the dura mater and during the exploration of the cord and of the nerves. It is evident that in the examination of very sensitive and delicate organs the least movement would be disastrous. (It has been proven by abundant clinical experience so far as the dura is concerned that such a profound anæsthesia is not essential. This membrane is by no means so sensitive as Horsley was led to believe by his first case. S. Ll.) Anæsthesia becomes exceptionally troublesome when the lesion is high up and accompanied by respiratory difficulties which are exaggerated by the lateral or ventral position necessary for the performance of the operation. Several deaths from chloroform and ether have already been noted among the comparatively small number of operations in this region and consequently the greatest precautions are necessary. Auffret has suggested the use of cocaine.

More important than the nature of the anæsthesia is to reduce the effects of the shock from the operation, which is particularly marked when the manipulation of the nerve centers has been long and painful. Chipault has never had or seen a serious shock in these cases, but reproduces Dercum's advice concerning its management.

It is equally indispensable after all spinal operations to immobilize the vertebral column for a longer or shorter time and more or less completely. The neglect of this precaution has entailed serious consequences, which might have been avoided by the employment of some method of support added to the employment of the surgical means for attaining consolidation (preservation of the periosteum, wiring suture of the vertebræ).

SAMUEL LLOYD.

CZERNY'S RECENT EXPERIENCE IN THE OPERATIVE TREATMENT OF CARCINOMA OF THE RECTUM.1

The author, in the present contribution, begins his observations with the year 1886, at a date when the indications for operative interference had become clearer and exacter than formerly, when at the Heidelberg Clinic they began to perform radical operations for carcinoma recti in cases where they had heretofore performed colostomy or had abandoned them as hopeless cases. The number of cases observed between the years 1886 to 1891 (inclusive)—six years, amounts to eighty-two. Of these 82, 68 (83 per cent.) were subjected to radical operations, on 8 (10 per cent.) palliative operations were performed—(5 Colostomies, 3 Curettements); and only six patients (7 per cent.) were refused an operation. The number of exstirpations increased from year to year, while that of Colostomies and Curettings is decreasing.

Four different methods of operations were employed: 1. The original method of Lisfrane with circular circumcision of the anus (17 times). 2. Dieffenbach's method.—Posterior and anterior incision of the raphè, and preservation of a peripheral portion of the rectum and sphincter (15 times). 3. Kocher's method.—Posterior vertical incision and removal of the os coccygis, twice. 4. Kraske's method.—Resection of lower segment of the sacrum, 34 times. The peritoneum was always opened when necessary. Ot the 32 cases of perineal extirpations, one case only resulted in death (from collapse after severe hemorrhage); this corresponds to a mortality of $3\frac{1}{10}$ per cent. With the sacral method, the losses were heavier. Of 36 patients, 7 died, a mortality of $19\frac{4}{10}$ per cent.

The total mortality of all the cases of extirpation of the rectum amounted to II_{10}^{7} per cent.

None of the cases treated by curetting and cautery (3 cases), nor of those subjected to colostomy (5 cases), died.

Now the following questions remain to be answered: How great as been the success in prolonging the life of the patients by the

Dr. G. B. Schmidt, of Heidelberg, in Beiträge zur klinische Chirurgie, Bd IX, Hft II, 1892.

operation? How many remain permanently cured? How many live with a recurrence, and how many have perished from a new formation of the growth? Further, it remains to be considered, whether those who have been liberated from their sufferings, have been made again useful members of society, and been rendered capable of work?

Of the thirty patients on whom, in the course of the last six years, the perineal operation was performed and who left the hospital, $16 (53\frac{3}{10})$ per cent.) have since died. The duration of their life after the operation amounted on an average to two years; the longest duration was four years, no data are known about four patients. The ten remaining, $(33\frac{3}{10})$ are alive and they report increase in body weight and well being.

Of the patients on whom the sacral method was practiced and who left the hospital, nine died in the course of the six years, (31 per cent.) from local recurrence, metastases, etc. Eighteen (62 per cent.) are alive, of whom six patients have passed the critical period of two years.

The reports from these patients are, in general, very good. Most of them are at work as before.

A principle question in the analysis of the results obtained, is the re-establishment of continence, upon which often rests the future usefulness and happiness of the patient.

The most ideal results in this direction, have been, however, only obtained in those few sacral operations, where it was possible to employ a circular suture of the gut. In these cases, absolute continence and perfect function of the sphincter was obtained. Bandages and pads were used to close temporarily the newly formed anus. For the sacral anus, Hochenegg's occluding pad seems to be the most appropriate; it is made after a plaster-of-paris cast of the opening of the new anus.

ALBERT PICK.

BOISLEUX ON INTRALIGAMENTOUS ELYTROTOMY AND ITS INDICATIONS.¹

Boisleux states that for the last two years he has used in his clinic the Thure Brandt method, as he saw it employed in the clinic of Dr. Ziegenspeck in Munich. As is well known, this method aims at the manual separating of the adhesions of the retroverted or retroflexed uterus and of the adnexa. By this means he has succeeded in affecting a lasting improvement or even a complete cure in a large part of his patients. Among twenty cases of retroflexio fixata were, however eight which absolutely resisted this treatment.

One of the latter cases was a thirty-one year old woman, who three years before had been treated by the Schultze method for fixed retroflexion, and who had for fourteen months worn a pessary. When the patient presented herself for treatment in October, 1890, the uterus again lay fixed in retroflexion.

From November, 1890, until December, 1891, the Thure Brandt method was persistingly employed to affect a separation of the adhesions. Finally, in order not to again have to go through with the hopeless process of Schultze, it was decided to employ another procedure, and open into the pouch of Douglas, as Schultze and Saenger some years ago suggested.

On the ground of exact anatomical consideration of the field of operation, under no circumstances should the sacro-uterine ligaments be injured or the transverse incision employed. The longitudinal median incision, which alone comes into consideration, should not be made immediately at the neck of the uterus, but about 1 cm. posteriorly. Then the sacro-uterine ligaments will not be divided at their insertion into the cervix. It may be stated that these ligaments begin where the posterior vaginal wall is attached to the uterus, inclose the rectum, and on either side insert themselves into the third and fourth transverse processes of the sacrum. They play an important rôle in maintaining the uterus in position; inasmuch as a shortening of these bands tilts the organ forwards, while a relaxation or division of their fibers is, among other things, a cause of prolapsus. When the uterus

¹ Centralblatt für Gynekol., 1892, No. 29.

is lifted up with the finger on the posterior lip of the cervix these two bands can be distinctly felt, and between them the depression which corresponds to the pouch of Douglas. Attention to these anatomical relations is of importance in the second part of the operation, which is as follows:

The patient is placed in the usual dorsal position for vaginal operations. A 2 per cent. carbolic solution and a 3 per cent. boracic acid solution are at hand: also a curette, forceps, needle-holder, etc. For drainage two rubber tubes, 7 mm. thick, are used, through the upper ends of which is passed a transverse piece about 5 cm. long, forming a T. The bladder and rectum must of course be emptied. When the patient is chloroformed, the vagina is cleansed, and the cavity of the uterus curetted. Then for five minutes the positive galvano-caustic is applied with the hollow sound of Apostoli. And finally a strip of iodo-form gauze is introduced into the uterine canal. The curetting is indicated, because in the most cases the adhesions are the result of an inflammation, the causes of which are materially removed by curetting and cauterization.

The pelvis is now brought up into the highest possible position, to prevent the intestines and omentum from falling forwards in the way during the manipulations. Martin's speculum is introduced, the posterior lip of the cervix is held with the hooked forceps; and the vagina is dilated by means of two lateral retractors. As the assistant draws the forceps upwards, two bands are seen running backwards from the cervix, which are the tense sacro-uterine ligaments, whose lower ends, as they enter the uterus, include the cul-de-sac of Douglas. The knife is now introduced in the median line, I cm. behind the neck of the uterus, and the retro-uterine sac opened by a longitudinal incision to the extent of 4-6 cm. While the incision is being made a finger of the other hand is held in the rectum. The left finger should now be disinfected, and introduced into the wound opening, while the assistant allows the forceps to fall into the hand of the operator.

The right hand upon the abdomen endeavors to find the body of uterus, and bring it forwards, while the left index finger frees the posterior surface of the uterus from all adhesions. There are cases in which this can be easily accomplished; in the cases of old adhesions, however, no inconsiderable time and strength must be consumed.

When the index finger has separated all the adhesions within its reach, the operator introduces the middle finger, and ascertains the condition of the adnexa. In the most cases they are surrounded by adhesions, and the effort must be made to liberate them. This is done first on the left side. The right hand is then disinfected, one or two fingers are introduced into the wound, and the left hand upon the anterior abdominal wall is held against the right adnexa. In this manner everything is loosened, and the uterus can easily be brought forward.

An intraperitoneal irrigation is now done with 3 per cent. boracic acid solution; the mucous membrane about the wound is freshened to the extent of 1 cm.; and, according to the size of the opening, two to four stitches of silk or catgut are introduced. The middle of the last suture should now be drawn out and held, as are the ends, with Pean forceps. The upper T shaped end of the drain can then be introduced above the suture. The drain is now lifted up by the assistant, and the operator ties the sutures. Finally the vagina is irrigated with 2 per cent. carbolic sol., and packed with iodoform gauze. On the first day a bloody, serous fluid escapes through the drain, which should be left until all the secretion has come away. This is usually after five or ten days.

In one of the author's cases the drain was allowed to remain seventeen days, and irrigation was done with 3 per cent. boracic sol., which at first brought away considerable purulent material.

Byford, 1 of Chicago, has recently strongly recommended the vaginal section—previously introduced by Thomas and Battey—for the reposition of the uterus, removal of diseased adnexa, and separating adhesions.

Stratz² broke up adhesions in twelve cases in this way, and did a perineoplasty to strengthen the perineum in order to accomplish a permanent reposition of the uterus, and at the same time to be able to do away with the pessary. In four cases he made simply the section

¹ Amer. Journal of Obstetr., 1888. April, p. 337.

² Zeitschrift für Geb. u. Gynek., 1891. Bd. XXI.

into the cul-de-sac because the uterus was movable. Hegar and Carsten in the Wiesbaden clinic, in 1887, called attention to the advantages of the perineoplasty; and Stratz found that the vaginal section was thereby rendered much easier by the enlarging of the field of operation.

Nelaton¹ related to the surgical society of Paris, a case in which he made the vaginal exploratory incision, in order to remove the symptoms of ileus, which, according to his view, had originated from a retro-uterine hæmatocele. It was, however, a retroflexis fixata, which he loosened, and made a permanent cure.

The author here introduces the seven cases in which he did elytrotomy according to the method above described. Without giving the histories of the patients, who ranged in age from twentyfour to forty years the cases may be condensed as follows:

¹ Bulletin de la Société de Chirurgie, 1892. No. 1.

	Diagnosis.	Operation.	Examination after the operation.	Later Examination.	Remarks.
	Endome-	Dec. 22, '91: Uterus curetted. Posi- tive galvanism,5 mn. 150 milliampéres. In- terlig. Elytrotomy. Drainage. Many adhesions be- tween uterus and rec- tum.	tion of slight an- teversion.	wards. Parame- trium free. Wound closed. Mar. 15. Con-	During the first 3 days a considerable amount of bloody serous fluid came away. Pt. was able to get up after 8 days. On Dec, 31, the drain was removed under chloroform. Perineorraphy after Tait-Saenger method. Jan. 16: Discharged cured.
11.	Tumor size	as case 1. Leftovary and tube	Uterus mova- ble and in slight anteflexion.	metrium free.	January 16: Irrigation through the drain with 3 per cent. boric sol. Sero-purulent discharge for first 6 days. Jan. 16-20: Irrigation twice daily. Jan. 31: Drain removed. Mild cystitis cured with arg. nit. 1:1000. Feb. 6: Emmet's operation. Feb. 22: Dismissed cured.
111.	tis chron'ca.	as case 1. Escape of pus from Donglas' sac. Omen- tum appeared in	ble.	Feb. 15: Uterus movable, and in slight ante-flexion.	After opening into Doug- las' pouch a quantity of pus escaped. Irrigation. Omentum returned of its self when the pelvis was elevated. Jan. 19: Drain removed.
IV.	fixata. Left adnexa en-		movable.	Dense scar tissue in Douglas' sac.	Much bloody serous dis- charge on first few days. Intraperitoneal irrigation was not well borne, Feb. 18: Bilateral renal colic; hæmaturia for 24 hours. Feb. 24: Colic on left side, Feb. 27: Dismissed cured
V.	Retrovers fixata, Cys- titis hæmor- rhagica.	as case I.	forward Noth- ing abnormal dis-	change in posi- tion of uterus, Subjectivesymp- toms good, May 15. Ute- rus in normal po-	During the first 3 days a serous fluid escaped now and then mixed with blood. Drain removed on sth day. 6th day, pat allowed up. 13th day dismissed cured. On the 15th day after the operation painless menstruation began.
VI.	Retrovers- fixata, Cys- titis.	Mar. 19, '92; Same as case I. Incision enlarged with scissors. Left border of uterus liberated with difficulty.	ward and is mov- able.	remains for	The separating of the adhesions in this case was exceptionally difficult Drain removed on strength day, March 26: Dismissed cured.
VII	fixata. Oophoritis	as case I. Ovarian cyst rup	movable The	lies forwards Douglas' wound closed, May 12: Uterus re mains for wards, Rightad mexa are not sen	For 5 days patient suf- fered from incontrollable vomiting. On the 6th day patient retained pep- tonized bouillon which had previously been given by rectum. Drain re- moved 5 days after th- operation. Apr. 2: Dis- missed cured.

Boisleux does not regard the perineoplasty advocated by Stratz as absolutely necessary. In case I was a perineal laceration of the second degree; nevertheless, the operation was thereby rendered no easier. The drainage is of the greatest importance, and never to be neglected in this procedure. Nor should the incision into the cul-de-sac be regarded as a trivial thing, because here one can very easily injure the sacro-uterine ligaments or the muscle fibres on either side. The operator shall follow the principle, that, in all operations for improving the position of the uterus, under no circumstances, shall any parts be cut which contribute to the normal fixation of that organ.

Byford, in his book, defends the elytrotomy against all objections. He says that with some care the antisepsis is just as easily carried out in the vaginal section as in the abdominal section; and that he prefers the latter only in cases in which the cervix is posteriorly, and the ovaries high up in the pelvis. He has employed the operation, however, only for the removal of the adnexa.

In this procedure the author has never observed any considerable hemorrhage, although the adhesions were often very resistant and sometimes involved the omentum and intestines. Byford and Stratz say nothing of severe hemorrhage. It is important for the operator to distinguish between a sero-sanguineous discharge and pure hemorrhage. The first gives a number of concentric rings on a linen cloth, whereas a drop of blood produces a simple red spot. In the latter case the vagina should, of course, be packed with iodoform gauze. Even when Laparotomy has to be done for incontrollable hemorrhage the drain should be allowed to remain in place after the operation.

If the deceased adnexa are present they may readily be removed by this way. A tumor the size of an orange is often felt, which is composed of exudate mass in which the tube and ovary are included. This tumor in one of the cases—case II—completely disappeared after separating the adhesions; the tube and ovary were of normal form and size. The patient is to-day completely well. In such cases the tube and ovary should be preserved.

Boisleux can not share the opinion of many authors, that, on account of the danger of infection, the vaginal operation should be limited as much as possible; for, on the one hand, the operation is preceded by a thorough cleansing of the vagina, but, on the other hand, the products of infection which have collected in the pelvis empty themselves through this channel. A tissue, however, which is so completely imbibed with ptomaines is not adapted to offer a favorable habitat for micro-organisms from the vagina.

In cases in which hysterectomy seems indicated, on account of bilateral disease of the adnexa or pelvic abscess, the intraligamentous elytrotomy places the operator in position to convince himself of the correctness of the diagnosis, and eventually to be able to save the patient from a more severe operative procedure. The double T shaped drain facilitates the escape of pus, and renders possible irrigation of the peritoneum; which latter should be done only when the discharge is purulent. The drain should, of course, not be removed till the discharge has completely subsided. In cases in which there was retroflexion of the uterus, it is well to allow it to remain eight or ten days, as it helps to hold the uterus in its new position. The drain annoys the patients so little that they may be up and about with it. The results which have been obtained in the cases which have been reported up to the present time-Byford, 12; Stratz, 15; Boisleux, 17—demonstrate well that this method earns the preference over all others.

The **T** drain serves to fix the uterus; it hinders the further formation of new adhesions; and prevents the intestine being caught between the uterus and rectum.

The adhesions in the above cases could never with certainty have been separated by the Thure Brandt method, because the effect of the procedure can not be controlled through the vaginal and abdominal walls. Nor, does the Schultze method offer any certain guarantee of a removal of the adhesions, because the operator, notwithstanding the strength employed, which the narcosis allows, works only indirectly through the walls of the vagina and rectum. Hemorrhage can in this way be very easily caused. The blood is not readily reabsorbed, and the formation of dense tissue is the natural result. The method furthermore is contra-indicated in case of acute inflammation.

The elytrotomy establishes the reposition of the uterus in one sitting, makes the use of a pessary superfluous, and does not impair the power of conception. In fibroma, carcinoma, prolapsus, and also metrorrhagia, which are not improved after curetting and electricity, elytrotomy may be done as a preliminary operation to vaginal hysterectomy. In this way the uterus may easily be freed of adhesions, and the recto-uterine ligaments divided with less difficulty than by the present methods.

Finally by collecting the cases which have been treated with good result, and the methods which have been employed, it may be concluded that the intraligamentous elytrotomy is indicated,

- (1) In adhesions of the uterus with the adnexa, and of the adnexa with themselves;
- (2) For the purpose of treating movable or fixed retrodeviations of the uterus, and for the treatment of pathological anteflexions;
 - (3) In every retro-uterine collection of pus;
- (4) In cases of pelvic peritonitis and general acute or subacute peritonitis, as may occur as a result of labor, menstruation, or after gonorrhœal infection; or lastly from such affections as tuberculosis;
 - (5) As an exploratory incision in uncertain diagnoses.

JAMES P. WARBASSE.

INDEX OF SURGICAL, PROGRESS.

GENERAL SURGERY.

I. Are Capital Operations justifiable in Cases of Hæmophilia? By Dr. C. BERTRAND (Wiesbaden). Reasoning upon the basis of a successful amputation of the thigh performed in a case of hæmophilia by Cramer in St. Joseph's Hospital in Wiesbaden, as well as on other successful operations by Schede, Czerny and Muller (Aix la Chapelle). Bertrand reaches the following conclusions: The danger of operative procedure has been greatly over-estimated hereto-Parenchymatous hemorrhage alone occurs, large vessels in hæmophilic persons bleeding no more than in normal individuals. Major operations may be performed very well in hæmophilics under certain precaution. These are as follows: Most careful ligaturing of even the smallest vessels, tight compression bandage, and when necessary the actual cautery and cotton tampons soaked in ferric chloride. Antiseptic measures are to be rigidly enforced, for the reason that secondary subcutaneous or intermuscular hemorrhages make the danger of suppuration more imminent.—Heidelberg Inaug. Dissert., 1892.

HEAD AND NECK.

I. Different Methods of Supplying Bony Defects of the Skull. By Dr. Moisson (Paris). The following conclusions, based upon a thorough study of the literature of the subject, are reached by the author: First.—Experimental and clinical experience indicate that buttons of bone removed by means of the trephine and replaced immediately unite by means of a callus which is usually bony. The same result follows transplantation of bone of animals, and in cases of temporary resection (Wolf, Wagner). Second.—The restoration of the vault of the skull is indicated in all cases of more extensive trephining for fractures, hæmatoma of the dura, etc., the dura mater being carefully re-united. Third.—The objections raised against thus

compensating for defects of the skull, particularly with regard to recurrences in Jacksonian epilepsy are without foundation. Fourth.— In case of trephining limited to a small area, supplying the defect by means of the removed portion of bone is the procedure indicated. Should, however, the operation attack a larger surface temporary resection is to be preferred. Fifth.—In cases in which the restitution of the resected bony portion is not permissible, as for instance in tuberculosis or carcinoma transplantation of bone from animals is to be preferred to König's antoplastic procedure, for the reason that the latter inflicts an additional injury. Sixth.—The hetero-plastic procedure, (celluloid, decalcified bone, etc.,) are followed by favorable results, the possibility, however, of resorption of the foreign substance, leads the author to reject them for the other methods,—Thése de Paris.

GEORGE RYERSON FOWLER.

II. Backward Dislocation (?) of the Lower Jaw. By Prof. Ed. Albert (Vienna). In writing the chapter on "diseases of the maxillary joint" for a manual on "dental surgery," the author could only give, in abstract, the article presented on this subject (i. e., supposed backward dislocation of the lower jaw), by Dr. Thiem at the XVIIth Congress of German Surgeons. As is known, it was formerly taught, that backward dislocation of the lower jaw can only take place, if the posterior wall of the region of the maxillary joint was broken; and, indeed, cases were reported where the lower jaw was dislocated into the osseous auditory canal.

These cases are, clinically, distinguished by the following:

- 1. The most striking symptom is the sudden inability to open the mouth. The mouth can only be opened with force and then everything is over and the function of the joint again restored; or the accident may recur, and again be remedied (habitual luxation). This most striking symptom, then, is entirely opposed to the principal symptom of forward dislocation, namely, the inability to close the mouth.
- The accident occurs: Either after opening the mouth widely, or the patient awakens from the sleep with a dislocated joint (cases are cited).
 - 3. This supposed dislocation was only observed in women.

To explain the process of backward dislocation Dr. Thiem has offered the following anatomical observations: The os tympanicum in the male turns backwards much lower down, while in the female it turns backward already at a point corresponding to the middle of the height of the processus mastoideus. It, also, at this point, does not, like in the male skeleton, form a bony ridge, but only forms an elevation, which may be called the tuberculum tympanicum, which hardly reaches lower down than the tuberculum articulare. Between this tubercle and the mastoid process exists a sufficiently large space to receive the small head of the inferior maxillary bone. In the median line this space is bordered by the styloid process; therefore, one may speak of a fossa tympanico-stylomastoidea. This fossa is in the female skeleton so very much more spacious and so entirely different from that in the male, "that a mere inspection of this location should suffice to differentiate a male from a female skull."

Dr. Thiem, further, says, that when the mouth is opened widely, a considerable passive stretching of, especially the lower fibres of the temporal muscle, takes place; these latter respond, in closing the mouth, with a powerful backward contraction, which is favored by the will of the individual. This action pulls the condyloid process over the tuberculum tympanicum, backward, into the fossa tympanico-stylomastoidea; the dislocation becomes, now, perfect.

Thus far everything would appear plausible; but people awake from the sleep with a backward dislocated jaw;—here every attempt at explanation is pushed aside.

Prof. Albert reports, now, at length, one of his own cases of "habitual luxation," and thinks that objective changes in the bony structure have to be taken into account in considering the cause of these dislocations. He recommended in his case long-continued massage of the joint.

He hopes, that this communication will cause others to publish analogous observations.—Wien. Med. Wochenschr., 1892, No. 22.

ALBERT PICK (Manchester).

CHEST AND ABDOMEN.

I. The Surgical Treatment of Empyema. By R. J. Godlee, F. R. C. S. (London). The author recommends as the site of election for incision in empyema the ninth rib just outside the angle of the scapula, for (1) it is just above the level to which the diaphragm becomes adherent to the ribs when it has been drawn up as much as possible. (2) It is, therefore, very soon, if not at first, one of the most dependent parts of the pleural cavity when the patient is standing up, and it is always the most dependent part when he is lying on his back. (3) Because (and this is a much more cogent reason) practically this is a much more advantageous position for the opening. He has never had to open one in front because the posterior opening did not answer, but has often had to supplement an anterior or lateral by a posterior opening, because the former did not drain the lower and posterior part of the pleura.

He is in favor of removing a piece of rib as a routine practice with very few exceptions, because first, is allows of the best possible exploration of the pleura with fingers and probes; second, it permits of the evacuation of masses of lymph; third, it obviates to a great extent the difficulty, which is common afterwards, of retaining or reintroducing the tube. He answers the objections to it as follows: (1) "That it is unnecessary." Granted in a certain number, but it is uncertain at the time of operation which these cases will be, whilst in the majority it is of great value, and except for one very rare contingency, it is perfectly harmless. (2) "The rib may not be regenerated." Again granted in exceptional cases, but, even if this do occur, it apparently makes no difference to the patient. (3) "It prolongs the operation and makes it more severe." The increased time and severity are really trifling; in case the patient be so ill that they are of importance, the resection may be omitted. Preliminary aspiration of a part of the fluid may be done for temporary relief, in preparation for more thorough interference later.

The drainage tube for an adult, of calibre as large as the little finger, should be just long enough to enter the chest cavity. It should never

be shortened, but when the time comes for its removal, it should be removed altogether,

In double empyema the right practice is to first open one side and let the patient get thoroughly accustomed to the modification of his thoracic arrangements, and then in due time to tackle the other.

The author advises caution in dealing with cases of tuberculous empyema and of pyopneumothorax.

It has not yet been proved why deaths sometimes occur during the washing out of empyemata-perhaps chronic ones, in which the same process has been carried out apparently in precisely the same manner and under exactly similar circumstances often before. It does not appear to depend upon the sort of fluid employed, nor upon the side of the chest affected. Under these circumstances it is probably wisest to avoid washing out unless it seems to be absolutely necessary, and to take particular care that no pressure of fluid is ever produced inside the chest-though it has not been proved that intra-thoracic pressure is the cause of the fatal result. Fortunately, the cases in which irrigation is necessary are very few. G. never employs it unless the discharge remains or becomes offensive several days after the opening has been made. The most stinking cases generally become quite sweet in a few days after incision, and, indeed, very often behave just as well as the aseptic ones. If it must be done, the patient should be in the recumbent posture, and a small tube-much smaller than the opening-should be attached to the end of a longer india-rubber tube which in its turn, is attached either to a simple glass funnel or to an irrigator. Whichever of these be employed, it should not be raised more than eighteen inches above the level of the patient.

A patient often loses a large amount of blood during the opening of an empyema, from the granulations lining the cavity which are suddenly released from the pressure to which they have been subjected. The amount is often quite difficult to estimate, because the blood runs into the pleura. It is the main factor in producing the shock, which is sometimes very severe, and which makes it essential that the patient should be carefully watched for a good many hours after the operation, and, if necessary, helped over the dangerous period by stimulants.

This bleeding is, of course, similar to that which follows the opening of tightly-distended abscesses with highly-vascular walls, which, as is well known, may sometimes be very serious.—*Brit. Med. Journal*, Oct. 15, 1892.

II. The Condition of Twenty-four Children after Cure of Empyema by Resection of Rib. By E. B. HASTINGS, M. D. (London) and H. N. EDWARDS, M. R. C. S. (London). The age of the patients at the time of operation was: I year in two cases; 2 years in six cases; 3 in two cases; 4 in three cases; 5 in three cases; 6 in three cases; 7 in one case; 8 in one case; 9 in two cases; and 13 in one case. The period since the operation was: 7 years in two cases; 4 to 5 in four cases; 3 to 4 in two cases; 2 to 3 in seven cases; I to 2 in six cases; and less than I in three cases. Physical examination showed that the general nutrition was good in 19 cases and fair in 5; none looked wasted or ill. In a majority of the cases, inspection of the chest gave no indication of disease beyond the presence of the scar. The spine was straight in 19 cases, slightly curved in three and distinctly curved in two. The shoulders were on the same level in 15, the side on which the empyema had existed was slightly lower in seven and distinctly lower in two. In no case was there distinct obvious flattening of the chest wall; it was completely absent in 16 and present in a slight degree in eight. The gap in the rib, caused by the resection, seemed to be closed by bone in all. The movements of the two sides . presented no apparent difference in 14 cases; the expansion was slightly deficient on the diseased side in eight, and markedly so in two.

Percussion obtained the following results: Dulness completely absent in 8 cases; some dulness in the immediate neighborhood of the scar in 7,—doubtless due to inflammatory thickening and increased rigidity of the parts there; slight dulness over a more extensive area in five; distinct dulness in four. Respiratory sounds: Unaltered in character and equal on the two sides in 10 cases; rather weaker in the situation of the scar in two; weakness over a considerable area of the diseased side as compared with those on the healthy side in ten, and in three of these the difference was but slight; distinct weakness on the affected side in the remaining two. In only one case were adventitious sounds

found limited to the affected side, and in this case only at the end of a deep inspiration; but four patients had slightly general bronchitis when examined. The position of the apex heart-beat was noticed in twenty of the cases, equally divided between right and left empyemata: close to the left nipple line in 17 cases; one inch and three-quarters of an inch respectively outside the left nipple line, probably from imperfect re-expansion of the left lung, in two cases of left empyema; in one case of right empyema, the apex beat was three-quarters of an inch to the left of the nipple line, presumably the result of adhesions formed before the pleura was drained, for imperfect re-expansion of the right lung would cause the position of the beat to be moved to the right. The impulse was in the fourth intercostal space in two cases, and in the fifth interspace in fifteen. These results point to good recovery of the lung in nearly all the cases. The healthy condition was particularly noteworthy in view of the fact that most of the patients were derived from the poorer classes living in unhygienic circumstances.—London Lancet, Aug. 20th, 1892.

III. Hepatic Abscess. By G. H. Younge, F. R. C. S. I. (British Army). Experience in India has taught the author that almost the only chance of saving the life of a patient who is suffering from an abscess of the liver lies in opening the abscess freely and draining it thoroughly. Early operation prevents extension, destruction of liver tissue, septic absorption, hectic fever and perhaps pyæmia. It prevents rupture of the abscess into the pericardium or peritoneum with a fatal result, and bursting into the pleural cavity and consequent discharge through the lung, which, though not necessarily fatal, is injurious in the extreme.

The author recommends the following method of treatment: As soon as an abscess is suspected, the patient is at once anæsthetized and the liver explored with the smallest sized aspirator needle, which is always submerged for some time in strong carbolic lotion before being used. A small puncture having been made through the skin with a bistoury over the suspected site of the abscess, the index finger of the right-hand is placed over the thick end of the needle, and it is taken up in

such a way that it remains full of the carbolic lotion, and passed into the liver through the puncture made with the bistoury. If pus is not detected, the needle is withdrawn and inserted in another place. The liver is carefully explored in different directions until either an abscess is detected, or until it is evident that one does not exist. If pus is found, the exploring needle is at once withdrawn and an incision made along its track down to the liver; then a bistoury is passed along the track of the needle until it enters the abscess-cavity. The bistoury is then withdrawn and the opening enlarged to about an inch by Hilton's method so as to obviate hemorrhage. The cavity is washed, out with carbolic lotion (1-50), which is repeated as long as any discharge continues, the drainage tube being kept constantly in place.

A single opening is sufficient if the abscess be opened posteriorly, but perfect drainage is impossible anteriorly through a single opening; in the latter case, pus is certain to accumulate in the abscess-cavity and to cause hectic fever and perhaps pyæmia—the only hope is to make a counter opening at the most dependent point of the abscess. The drainage tube should be passed into the abscess-cavity through the upper opening and then brought down through the lower one.—London Lancet, Aug. 27th, 1892.

James E. Pilcher (U. S. Army).

IV. Pancreatic Cyst—Laparotomy—Resection of Cyst and Suture to Abdominal Wall—Cure. By Dr. Trombetta, (Italy). A woman, thirty years of age, married and mother of two children, had had pain under the left costal arch, and had noticed a hard tumor of the size of an apple and painful on pressure in this locality. At this time she was two months pregnant; she was delivered safely at term. The tumor grew very slowly after the confinement, but was not troublesome. The growth continued to increase until a little over a year from the time when it was first observed she applied for treatment. In the abdomen, a circumscribed swelling, extending from the left costal arch to the umbilicus could be made out. This tumor was smooth, round, and fluctuating. It was punctured for diagnostic purposes, and 400 grm. of a dense brownish fluid was removed. This fluid coagulated and contained a great many red corpuscles, many clots of hæmatic pigments, a few white globules and

crystals of cholesterin. On the supposition that it was a cyst connecting with the spleen, operation was advised as soon as it filled up again. Four months later, just two years from the time when the tumor was first noticed, she returned, and it was found that the growth was somewhat larger.

The abdomen was opened by an incision reaching from the costal arch to a few cm. below the umbilicus. The tumor was covered by the gastro-colic omentum. When this was pushed upwards the tumor was seen to run down towards the vertebral column, where it had a large attachment. The stomach was displaced upwards. The spleen was normal and was at the upper side of the cyst.

In consequence of the retro-peritoneal position and the large attachment of the cyst enucleation was not attempted, but an incision was made to empty it of its contents, and the opening in the cyst was sewed to the margins of the abdominal incision. The internal surface of the cyst was very red, owing to a great number of blood vessels, and here and there elevations resembling fleshy nodules were noticed. About half of the cyst wall was removed before it was fastened in the abdominal wound. The dressing consisted in packing the cyst cavity with iodoform gauze. At first very large quantities of a secretion resembling plastic lymph were discharged from the wound, but the cavity gradually decreased in size and the amount of secretion lessened. When the patient left the hospital only a small fistulous opening remained, the skin about which, although it was reddened, did not present the excoriations and eczema described by Senn as usual in pancreatic cysts. Examination of the cyst wall, contents and fluid made the diagnosis clear. The removed portion of the wall consisted of a thick envelope of fibrous connective tissue covered inside with cylindrical epithelia in several layers. Five months later this patient had a severe hemorrage from the sinus, but recovered from its effects in a short time. - Arch, ed Atti della Societa Ital, di Chirurgia, 1892.

V. Splenectomy, for a floating hypertrophied Spleen. By Dr. Turretta, (Italy). A woman, twenty-six years of age, had had troublesome symptoms for three years and had an enlarged spleen.

The red blood corpuscles were in the proper proportions and there were no plasmodiæ of malaria present. When the tumor was exposed it was found to have a pedicle much shorter than was anticipated, and both the stomach and the pancreas moved with it. The pedicle measured 7 cm. and it was divided in five bundles, and cut off 2 cm. above the ligature. A remittent fever set in three days after the operation and persisted for two months, and a swelling was soon noticed near the pedicle. Forty days after the operation this swelling was almost gone, but the patient's general condition being so much worse, ten days later an incision was made in the left lumbar region down to the peri-renal tissue. The kidney was in a slightly lower position than usual, but there was nothing else to indicate an encysted intra-peritoneal abscess, so the wound was sutured.

The patient promptly recovered from this operation and all the other symptoms, and a year following the operation was in excellent health.—Arch. ed Atti della Societa Ital. di Chirurgia, 1892.

VI. Gastro-duodenal Resection. By Dr. Durante, (Italy). A woman, thirty-six years of age, suffered from pain and a swelling in the median line 7 cm. from the umbilicus for six months. The symptoms pointing to cancer of the stomach, the abdomen was opened and there was at once evident a tumor directly below the left lobe of the liver on the pyloric end of the stomach. It was not adherent to any of the surrounding organs, but the stomach and the upper end of the duodenum alone were involved.

The stomach having been ligated above the tumor and the duodenum below, it was removed; the excised portion included about one-third of the former and a piece of the latter organ.

The mucous membrane of the stomach was cleansed and disinfected with boracic acid. The incision of the duodenum was transverse, of the stomach oblique and that portion of the gastric incision near the greater curvature was sutured until the lumen of the orifice corresponded to that of the duodenum.

Billroth's method of suturing the intestinal and gastric walls was employed. Two indurated and enlarged glands were removed from

the mesentery and the abdominal wound was closed. Occlusion treatment. Partial nutrition by mouth resumed on the third day. The portion of the stomach removed was in the form of a truncated cone with a curved axis, its upper part measured 3 cm., its lower 12. The tumor began at the pyloric sphincter. Radical cure of this case is considered problematical, although in spite of its difficulty in such cases, it is still possible. In those exceptional cases where the pylorus is free from adhesions, gastro-duodenal resection offers a faint probability of a radical cure. In the next case where resection is impracticable, it is intended to make a large communication between the stomach and duodenum across the cancerous mass.—Arch. ed Atti della Soc. Ital. di Chirurgia.

VII. Laparotomy for Colicystorraphy and Enterorraphy of gun-shot wound. By Dr. Sorge (Italy). A young man twenty-two years old attempted suicide by shooting himself in the right hypochondrium. A transverse incision was made from the wound 9 cm. in length running towards the median line and another incision was continued along this line downwards for 12 cm. making a flap of the shape of a large 7. It was at once noticed that the gall-bladder had been injured as there was a large effusion of bile and a longitudinal wound was found on the antero-inferior segment caused by the projectile grazing the distended viscus. On one side of the skin was a slight destruction of the mucous membrane. This wound was temporarily closed by a pair of forceps and the bile that had already escaped was wiped out with material impregnated with warm sublimate solution. The wound was then sutured with four Lembert sutures, and covered with gauze while the intestine was examined. In a loop near the gall-bladder two other wounds were discovered and closed by suture. They were evidently entering and escaping orifices andwere five to six cm. apart. The intestine being empty and the wounds small, 7/8 mm., there was no escape of intestinal contents so far as could be observed, but the abdomen was irrigated with a 1-5000 sublimate solution. Guided by the direction of the wound the left side of the vertebral column was searched for the projectile and it was found in the internal fossa iliaca. The operation lasted two hours and the patient was discharged on the fourteenth day cured.—Arch. ed Atti della Societa Ital. di Chirurgia, 1892.

VIII. Case of Enterostenosis from Cirrhotic Mesenterv. By Dr. Biondi (Italy). A woman, thirty-one years of age. was confined against her will in a convent, living a monotonous and sedentary life. She became badly constipated, having a movement only once in three days, and was obliged to have recourse to clysters. laxatives and finally to castor oil combined with croton oil. She became emaciated, weak and was obliged to remain in bed complaining of dull pain in the left epigastric region. She was treated with narcotics, massage, electricity, etc., without result. Intestinal loops only partially distended are often delineated across the thin abdominal walls. A small tumor when there had been no movement of the bowels could be made out. A diagnosis of cicatricial adhesion near the left angle of the colon being made and other remedies proving useless and harmful, exploratory laparotomy was performed. The loop of the transverse colon was found distended with gas, while the descending colon was empty. The intestinal tract was fixed by a short mesentery, the visceral peritoneum of the loop was opaque. There were small and easily detached adhesions along the free portion of the intestine. The involved intestine was freed from the surrounding adhesions by incision between two ligatures of a cirrhotic mass surrounding it. Bowels moved spontaneously the following day and at the end of six months the patient was reported as perfectly well, having a regular daily passage from the bowels.-Arch. ed Atti della Societa Ital. di Chirurgia, 1892.

SAMUEL LLOYD (New York).

IX. A New Method of Excising the Upper Portion of the Rectum and the Lower Segment of the Sigmoid Flexure of the Colon. By H. W. MAUNSELL (Dunedin, New Zealand). After preparing the patient by feeding with small

quantities of farinaceous food and beef tea for a few days previously, and irrigating the stomach and lower part of the rectum night and morning with hot water and salt (3ss-Oj), the lower portion of the rectum and anus below the carcinoma is cautiously dilated with a small Barnes's bag or bivalve vaginal speculum, well greased with iodoform ointment. The patient is kept in bed and the surface of the abdomen and perineum rendered thoroughly aseptic with nailbrush, soft soap, shaving and bichloride solution; the limbs and upper part of the chest are covered with wadding and the patient placed upon a portable rubber operating mattress, devised by the author. When anæsthetized, the patient is placed in the lithotomy position. The assistant surgeon sits at the end of the operating table. He first divides the sphincter ani backwards toward the cocceyx with a straight, probe-pointed bistoury, and then passes a large bivalve vaginal speculum through the anus up to the cancer; the free division of the sphincter ani prevents the subsequent distension of the rectum with feces and the possible tearing out of the circumferential sutures. After completely emptying the bladder, a median abdominal incision is made down to the peritoneum from a point one inch above the umbilicus to the pubis. After controlling all hemorrhage, the peritoneum is slit up to the size of the external opening. The edges of the wound are separated with a steel wire laparotomy speculum, and the diaphragmatic intestinal retractor, formed of a wire framework, 4 inches wide and 7 or 8 inches long-in a shape similar to that of a cross-section of the abdominal cavity-covered with 2 or 3 layers of aseptic gauze, is placed in the abdominal cavity; with a long handled, slightly curved needle, with the eye at the point, two thick silk sutures attached to the lower corners of the wire frame are passed out through the abdominal walls on either side, immediately above the crest of the ilium and 2 or 3 inches external to the outer border of the quadratus lumborum. The portion of the gut to be operated upon is then isolated and the rest of the intestines are lifted out of the pelvis and tucked securely above the lower rim of the wire frame; the sutures are made taut and fastened to the laparotomy speculum. The diaphragm keeps the intestines warm and well upward and backward out of the pelvis and gives the operator an unobstructed view of all the pelvic organs. If there is a fæcal accumulation above the cancerous stenosis, it is gently pressed back into the colon with the fingers and thumb; this manœuvre greatly facilitates the subsequent artificial invagination of the diseased segment of gut.

With a long packing needle, a piece of broad tape is passed through the proximal side of the cancer, first on one side and then on the other; the assistant then drags the ends of the tape out through the speculum with a sequestrum forceps; the broad loop of tape now lies across the proximal side of the diseased segment of gut. A small incision with a tenotomy knife is made through the entire thickness of the peritoneal fold between the rectum and the bladder and bladder or the rectum and uterus in the female. The upper part of the rectum, held between the finger and the thumb of the left hand, is drawn out from the sacrum so as to render its peritoneal attachments taut. A pair of long probe-pointed angularly curved scissors is then passed into the opening made with the tenotomy knife and the peritoneal attachment of the rectum is completely divided, first on the left side and then on the right; during the division of the lateral reflexions of the peritoneum it is imperatively necessary to keep the probe point of the lower blade of the scissors pressed well upward and outward from the median line of the gut against its inner surface; only in this way is it possible to divide the peritoneal duplicature, which forms the meso-rectum, without injury to the vessels, nerves and lymphatics of the rectum. If the lower portion of the rectum is sufficiently dilated with the speculum, there is now no anatomical impediment to the invagination and complete prolapse of the upper three-fourths of the rectum out through the anus; one or two vessels may accidentally be injured but they can easily be dealt with in the usual way and the loose cellular tissue offers no resistance. No more of the peritoneal reflexion should be divided than is absolutely necessary to permit of the invagination out through the anus.

Complete collapse of the bladder having again been assured, the prolapsed bowel is washed with warm very dilute bichloride solution and a small incision made with a tenotomy knife through the entire thickness of the returning or middle layer of the intussusception and as near its apex as the disease will safely permit; the probe-pointed

angularly-curved peritoneal scissors are passed in through the opening made with the tenotomy knife, the prolapse being cut all around so as to completely free the entering or inner layer. This is now pulled down with a vulsellum forceps until all the diseased portion appears completely outside or below the cut border of the returning or middle layer. The inner and middle layers of the intussusception, about an inch above the disease, are transfixed with two fine long straight needles armed with chromic gut.

The entering or inner layer is now amputated a full half inch above the cancerous mass. Transfixing with long needles the entering and returning layers of the intussusception previous to amputation of the cancer prevents it from flying back inside, and insures the proper relative position of the different layers of the bowel before sewing them up. The cancerous mass having been amputated, the needles are passed through and the sutures picked up in the middle of the invaginated bowel, divided and tied on both sides; the ends of the four sutures left long, so that an assistant can hold the cut ends of the bowel in position until it is plugged with absorbent wool previous to completely suturing it circumferentially. Twelve passages of a long straight needle through both sides of the gut as above described suffice for the introduction of 24 sutures, which are generally sufficient; nearly half an inch of the entire thickness of the coats of the gut should be included in each suture.

Before cutting off the four long sutures, the plug of absorbent wool is removed, the wire intestinal retractor loosened and a long tube is passed up the colon, which is thoroughly washed out with hot boracic or salicylic lotion; all hardened fæces are assisted down the colon by the fingers and thumb within the abdomen. The sutured ends of the bowel are dried with absorbent wool and painted over with Woefler's mixture of alcohol, glycerine and colophony. The whole of the prolapse is now dusted with iodoform and amorphous boracic acid and the bowel gently returned; the return of the circumferentially sutured bowel is facilitated by slight pressure from below and gentle traction from above. The rectal peritoneal reflexion which was divided is now sewn up with a few interrupted sutures to prevent any subsequent prolapse of the gut. The laparotomy speculum

and the intestinal retractor are next removed and the median abdominal wound closed. The operation demands, in addition to the anæsthetist, a good assistant to keep in the invagination of the diseased segment of gut through the speculum, since, from aseptic considerations, the laparotomist should leave this part of the operation to another.

The author considers the operation especially applicable to the following conditions:

- r. Cancers of the upper two-thirds of the rectum and the lower segment of the sigmoid flexure of the colon.
- 2. Tertiary syphilitic ulcerations of the middle and upper portions of the rectum, not amenable to medicinal treatment.
 - 3. Procidentia recti, not amenable to medicinal treatment.
- 4. Congenital absence of the anus and lower portion of the rectum. In a case of this kind, where careful dissection in the midperineum fails to discover the gut, instead of making a lumbar or inguinal anus, the surgeon should find the end of this bowel by median section and draw it down to the proper location by the method given here.—London Lancet, Aug. 27, 1892.

JAMES E. PILCHER (U. S. Army).

GENITO URINARY ORGANS.

Hæmaturia from a subcutaneous laceration of the left Kidney; Nephrectomy. By Dr. Sorge. Although this patient had been struck by the lever of a press over the region of the left kidney, and had hæmaturia, there was no ecchymosis nor other external indication of an injury. He did not improve under any method of treatment, so an incision was made along and a little in front of the angulo-scapular line from the 12th rib to the iliac crest. (12 cm.)

The adipose capsule of the kidney was markedly ecchymotic and the renal pelvis was full of blood. A ligature was applied below the pelvis, and the long ends were used to make a slight traction so as to pass another ligature lower down. A third was then applied in the same manner, and the pedicle was cut above the first ligature, leaving all

these intact and thus making sure that no secondary hemorrhage could result. The upper half of the wound was sutured, the lower half packed with iodoform gauze. The long ends of the ligatures were left, carefully protected against traction, in the lower angle of the wound. The quantity of urine passed during the first day varied between 600-800 gms. There was a slight rise of temperature for twelve days. The ligatures fell off on the twenty-second day, and the patient was discharged on the sixty-fifth day after the operation; a year afterwards he was in good health.

The removed kidney was of normal shape and size, and presented on its surface large ecchymotic spots without any laceration. No capsular nor peritoneal effusions. The renal pelvis being filled with blood confirmed the supposition that the lesion was internal. On dividing the organ into halves the lesion was immediately discovered, and consisted of a hazel nut-sized cavity, filled with a blood clot, a little above and to the side of one of the renal calices.—Archiv. ed Atti della Societa Ital. di Chirurgia.

SAMUEL LLOYD (New York).

ABSCESSES.

I. Amæbæ in an Abscess of the Jaw. By Dr. Simon Flexner (Baltimore). The writer prefaces his own case by an abstract account of a case, reported by Nasse in the Archiv für klinische Chirurgie, Bd. 42, p. 40, in which amæbæ were found in large numbers in the gangrenous tissues around the external incisions that had been made for the relief of an abscess of the liver. The present case occurred in the Johns Hopkins Hospital, and was in the person of a male, 62 years old, in whom there had gradually developed an extensive brawny swelling in the floor of the mouth occupying the entire space included within the arch of the inferior maxillary bone. This was connected with a limited necrosis of the alveolar process of this bone. Upon incision a large thick-walled abscess cavity was exposed. Microscopical examination of the pus evacuated showed at once a large number and variety of bacteria, and in a fresh and untreated specimen of the pus many actively motile bacteria were observed.

In such a fresh specimen were found, mixed with the pus cells, detritus and red blood corpuscles, larger cells possessing the power of altering their forms. Closer observation soon led to the conclusion that these bodies were not tissue elements, and they were recognized as amœbæ.

In the fluid portion of the pus these amœbæ were fewer in number than in the opaque flakes mentioned above, and while some fields of the microscope (Leitz, No. 7 objective and No. 3 eyepiece) did not contain any, others showed several in each field. In striking contrast to this picture was that furnished by the examination of the flakes. By gently teasing these out in normal salt solution, a surprisingly large number of amœbæ were found. Every field showed one, and most fields several. After having once been seen they could easily be recognized among the other cells, even after they became round and ceased to exhibit motility. They were much larger and possessed a different refraction than the pus cells. Their contents, too, were totally different from the granular and fatty material enclosed by the leucocytes, and they much exceeded the latter in size. These flakes of white tissue evidently consisted of necrotic and detached pieces derived from the walls of the abscess, and it would appear as if they were permeated by leucocytes and amœbæ.

The characters of the amœbæ present in the pus of this abscess and in larger numbers in the necrotic material found in the pus, resembled in so many respects those of the amœbæ dysenteriæ first described by Lösch and since by many others, that the author does not think that by means of any criteria we now possess, would it be possible to distinguish between the latter and those found in the abscess just described.

It is to be regretted that no opportunity was afforded for the study of the relation of the amœbæ to the tissues. The favorable progress of the case entirely precluded this being done. In the absence of that important criterion as to the relation between the amœbæ and the pathological process, only their presence can be positively asserted, and the fact brought out by Nasse's case that amœbæ can enter the subcutaneous tissue and be associated with at least suppurative changes.—Johns Hopkins Hospital Bulletin, September, 1892.

BONES-JOINTS--ORTHOPÆDIC.

I. Billroth's Operative Treatment of Severe Cases of Tuberculosis of Bones and Joints, By Dr. F. KRAUSE. Krause advocates very strongly Billroth's method of dealing with tuberculous cavities by filling them, immediately following operation, with iodoform glycerin, closing them hermetically, tuberculous tissue being previously removed as thoroughly as possible with Volkman's sharp spoon, and the knife. He claims that used in this way the iodoform exerts its full and complete effect. In open tuberculous tissue the iodoform is practically without effect, owing to the oxygen of the air. In cases of previously opened cavities, fistulæ being present, germs of other kinds are found in the cavity. Under these circumstances before the hermetic sealing of the wound, tampons are used for 6 or 8 days; the tampons are then carefully loosened in order to avoid hemorrhage, iodoform glycerin is now injected, after which the wound is closed. K. especially warns against vigorous sponging of the wound whereby tuberculous granulations may be forced into newly opened recesses, irrigations with sterilized physiological solution of sodium chloride are recommended instead.—Deutsch. Med. Wochenschr., 1892. No. 9.

II. Operative Treatment of Congenital Luxation of the Hip. By Prof. A. Lorenz (Vienna). L.'s employment of Hoffa's procedure led him to devise an improved method, the former not fulfilling all of the indications. Chief among the difficulties encountered was that found in retaining the head of the femur in the new acetabulum. Contrary to the statements made by Hoffa, the pelvi trochanterii muscles were not found to be the principal factors in preventing reduction. Experiments made by L. demonstrated that the muscles inserted in the tuber ischii and anterior superior spine of the ilium are shortened and therefore form a barrier to reduction. He therefore, preliminarily to the formation of an acetabulum and final reposition, brings the femoral head to the position which it is to ultimately occupy. This reduction is to be accomplished by myotomy of adductors, as well as the muscles attached to

the tuber ischii and anterior superior iliac spine: the pelvi trochanterii are to be left intact. He operates as follows: Powerful extension being made by an assistant; division of the adductors and separation of the muscles attached to the tuber ischii is accomplished through the same incision; the latter muscles appear as a thick stretched cord. Extension being continued an incision 6 or 7 cm. long is made from the anterior superior spine of the ilium directly downwards. The wound edges are separated from each other, and the deep fascia including the tensor vaginæ femoris, anterior edges of the gluteus medius and sartorius are divided transversely; the dissection now reaches the space between the sartorius and tensor. The tendon of the rectus femoris is now separated below the anterior inferior spine. The anterior capsule of the joint is now bared and the head of the femur identified by the finger, resting in a position opposite the site of the acetabulum. The capsule is opened by a crucial incision. The extending force is now relaxed and the acetabular region exposed, the manipulations needed to accomplish this, which are performed by the assistant, consisting of flexion, adduction, and forcing the limb in an upward direction. It is very important at this stage to separate all individual stretched portions of the capsular structures from the anterior side of the neck of the femur This is accomplished by a probe formed knife introduced along the index finger as a guide. The acetabular region being now accessible, Hoffa's bayonet spoon is used to deepen the cavity, care being taken not to injure surrounding important structures. It will now be found, if all restraining forces have been properly dealt with, the head of the femur can be placed in the cavity with but slight force. The centre of the skin wound is left open, catgut sutures being placed above and below. The limb is dressed and fixed in a position of slight abduction.

Four successful cases are reported; one of these was a fifteen-year old girl.

The suggestion is made that an analogous procedure be employed in old luxations of the femur. A posterior incision would, however, be necessary.—Centralbl. f. Chirg., August, 1892.

GEORGE RYERSON FOWLER (BrooklyE).

GYNECOLOGICAL.

I. Pelvic Suppuration. By Dr. Paul Segond (Paris). The classification of pelvic suppurations should comprise all pathological conditions characterized by the presence of pus in the pelvis of women, and it is especially important to distinguish between secondary and primary suppurations. The latter correspond to the properly called peri-uterine collections. They have for their point of origin an inflammatory process seated either in the appendages, or in the periuterine cellular tissue, and the classification based upon the intra or extra peritoneal localization of the pus agrees with this condition absolutely. It is to collections of this nature that one should exclusively reserve the name of pelvic suppurations, properly called. He would make an exception only in favor of suppurative hæmatocele, of which the diagnosis is sometimes so very difficult that it is almost impossible to tell whether the suppuration is primary or consecutive to an effusion of blood.

All other conditions are the purulent collections which develop inside or around a pre-existing tumor. If certain rare cases of suppurating cysts of the broad ligament—which it is perhaps advantageous to treat by simple incision—are excepted, as well as certain secondary purulent collections, which it is sometimes prudent to evacuate before the removal of the tumor accompanying them is undertaken, one may say, as a general thing, that in the cases of women afflicted at the same time with suppuration and abdominal tumor, laparotomy is the operation of choice.

Nevertheless, Segond has shown that in this first group of cases, as well as in true pelvic suppuration, vaginal hysterectomy may be strongly indicated, and may render brilliant service. This does not apply merely to the cases of uterine cancer complicated by pelvic suppuration where it is understood that vaginal hysterectomy is the only operation that is expedient. What he wishes to establish is, that this operation is frequently the best when suppuration is present in women with large fibromata; the volume of these tumors, however, should not be excessive, and the superior limit of the uterus, or the fibroma, should not be higher than the level of the umbilicus.

In the treatment of true pelvic suppuration, in the first place the serious interventions, such as laparotomy or hysterectomy, should be scrupulously reserved for the women in whom conservative methods are manifestly impracticable, either when one has exhausted all the resources, or when the urgency of the case does not admit of any temporizing. An effort should be made to avoid these methods, and in doing this the salutary influence of a well-directed uterine therapeusis should be insisted upon. Doleris says very justly, and Segond agrees with him fully, that the main preventives are vaginal antisepsis, curretting, wide dilatation and uterine drainage. There is no doubt that by skillful management the number of justifiable major operations can be much diminished.

Segond advocates Valton's methods of treatment at the initial period of a pyo-salpingitis where the tumor is small, when there is no imminent danger, and especially when there is any doubt about the contents of the pocket, which is not rare. But that is all that can be said for the method, and it would be dangerous to generalize any more. Briefly, the indications are exceptional in the treatment of pelvic suppurations, and, although the peri-uterine disorders may be slight, it is often more prudent at the beginning to make a direct surgical onslaught than to risk a preliminary curretting.

Surgical interference is necessary whenever there is any pus found about the uterus. Two methods may be detailed: one to simply evacuate the pus; the other, more radical, consists in the evacuation and the more or less complete removal of the seat of the disease.

The indications for the first method are very clear in particular cases—that is, when the pus has approached an accessible point either near the abdominal wall or the vaginal cul-de-sac, there is no choice in regard to the intervention. It is essential first to incise and drain, leaving until later the removal of the causal lesion.

It is not difficult to judge of the intrinsic value of the different proceedings for reaching pus in the pelvis. The methods are numerous, and without mentioning simple puncture, which should be discouraged here as in other circumstances, we have to judge of the different methods of incision, according as they proceed through the vaginal,

the rectal, sacro-coccygeal, perineal, inguino-sub-peritoneal or parietal wall

The indication for parietal incision is simply to evacuate the pus at the place where it points. A pelvic collection should be treated like a common abscess. The evacuation of a pelvic abscess through the rectal wall is bad surgery. As for the sacro-coccygeal and the perineal methods, which have lately been advanced, it may be wise to suspend judgment. It is doubtful whether they will ever be as valuable as laparotomy or operation through the vagina.

The only two methods of value are the sub-peritoneal incision in the inguinal region and the incision through the vaginal wall.

The only advisable vaginal incision is that which evacuates the pus without opening the peritoneum, as in true pelvic abscess and adherent pyosalpinx.

Laparotomy and hysterectomy are in the majority of cases the best treatment for suppurations.

Hysterectomy has gained in favor, and is unquestionably indicated in all cases of pelvic suppuration after laparotomy, and in suppurative pelvic peritonitis surrounding the uterus, with extensive adhesions and multiple pus pockets.

It is indicated in all cases of pelvic suppuration, which are now treated by laparotomy and removal of the bilateral appendages.

The three considerations upon which these views are based are the little danger, the superior efficacy, and the absence of a scar. Segond has operated 92 times, 8 deaths.

The indications for hysterectomy are the same as those for removal of the uterine appendages. Laparotomy should be given the preference whenever the diagnosis of the bilaterality of the conditions seems doubtful.—Annales de Gynécologie et d'Obstétrique, October, 1892.

II. A New Method of Cure for Irreducible Chronic Inversion of the Uterus. By Dr. D'Antona (Italy). In a case where nothing seemed available except removal, the author has succeeded in restoring the uterus to its normal position and function by laparotomy. Even then it was impossible to overcome the inversion

until an incision was made through the cervical ring dividing the double uterine walls through their whole length. An assistant then inserted his hand into the vagina and pushed the uterus upwards, the gap made by the incision being lacerated and enlarged until the vaginal insertion was partly destroyed and the livid fundus passed between the lips of the wound. The continued firm pressure of the two thumbs against the uterus while the other fingers kept the ring on the stretch finally upset the fundus. The upper angle of the uterine wound was lacerated during the manipulation. There was but little loss of blood and as soon as it was controlled the wounds were closed by catgut. The right ovary which was cystic was removed and the anterior surface of the uterus was attached to the abdominal wall. The result was a complete cure.—Archivio ed Atti della Soc. Ital. di Chirurgia. 1892.

SAMUEL LLOYD (New York).

III. Extirpation of the Uterus for Prolapse Combined with Plastic Operations. By Dr. A. MARTIN (Berlin). In cases of extreme prolapse, M. removed the uterus and then performed colporrhaphy. He was induced to make use of this combination by the following condition: The uterus was attached by adhesions in its prolapsed state and was lying fixed beneath the bladder in the position of either retroflexion or anteflexion; the bladder had become extensively attached to the corpus uteri, the bladder and rectum being likewise attached to each other by firm adhesions. Further, extirpation of the uterus is indicated if this organ, with the great mass of its enlarged cervix lies outside of the genitals, the body having become adherent to the posterior pelvic wall. Finally, extirpation is justifiable in cases in which repeated colporrhaphies are unsuccessful. After removal of the uterus the wound in the pelvic roof being sutured, anterior and posterior colporrhaphy after M's. own method was performed in some instances; in others, Hegar's method was followed. In our instance the plastic perineal flap was employed. In twenty-two women operated upon in this manner one death followed. This was attributed to pulmonary embolism occurring on the sixteenth day. Berlin klin. Wochenschr., 1891, No. 45.

GEORGE RYERSON FOWLER (Brooklyn).

- IV. On the Relative Merits of Vaginal Hysterectomy and Supravaginal Amputation, by Electro-cautery in the Treatment of Uterine Cancer. By Dr. John Byrne (Brooklyn). In his address as President of the American Gynecological Society at its session in September, 1892, Dr. Byrne, after analysing the published statistics of vaginal hysterectomy for uterine cancer, formulates his conclusions as follows:
- r. The ambiguous manner in which the statistical tables of vaginal hysterectomy have been constructed is so misleading and in some instances so suggestive of erroneous inferences, as to render their compilers open to a charge of suppressio veri or suggestio falsi.
- 2. Any operation known to be attended or followed by an average primary mortality of over fourteen per cent. in the hands of the most experienced surgeons, is a grave and a dangerous one, and demands for its justification a large percentage of *permanent* cures.
- 3. The frequency and rapidity with which recurrence takes place after vaginal hysterectomy for cancer, even when the disease has appeared to be limited and circumscribed, prove conclusively that it can lay no just claim to this essential feature.
- 4. As the average period of life in cancer of the uterus, when not operated upon, is not less than two years, but often more, suffering has not been lessened but aggravated, and life has not been prolonged, but shortened, in the vast majority of all cases thus far subjected to vaginal hysterectomy.
- 5. As in twenty-eight cases of vaginal hysterectomy for cancer of the fundus at the Berlin Klinik, no less than seven died from recurrence within twelve months, the grounds on which some have conceded to this operation even a limited field are inconsistent with facts, and therefore not tenable.
- 6. As the operation is, in many respects, more dangerous than the disease for which it is undertaken, and, as the majority of all patients afflicted with uterine cancer would live longer without than with it, it is not safe nor a useful operation and as such is unjustifiable.
- 7. On several occasions during the past twenty years, and more particularly in a paper read before this society three years ago, ample and convincing proof, clinical and statistical, was presented, as to the

claims and unique characteristics of the electric cautery in the treatment of uterine cancer, and further observation has been more than confirmatory of opinions then advanced.

- 8. Amputation of a cancerous cervix by the cautery knife is free from danger, a safeguard against all infection, traumatic or septic, and, what is of still greater importance, it is destructive to latent cancer-cell proliferation in tissues far beyond the line of incision; hence, much more is comprised in the operation than the mere removal of a part or parts more actively involved in the work of destruction.
- 9. Any method of operating for which advantages so vital and so far-reaching can be claimed and established, and which thus distinguished it from all others, renders its adoption on the part of those who undertake to operate for cancer of the uterus no less than a moral obligation.—Proceedings Amer. Gynecol. Society, 1892.

REVIEWS OF BOOKS.

CURE RADICALE DES HERNIES AVEC UNE ETUDE STATISTIQUE DE 275 OPERATIONS. PAR LE DR. JUST LUCAS-CHAMPIONNIERE. pp. 724. Paris: Rueff & Cie, 1892,

This is the second edition of a work by the same author published in 1886. In the introduction it is stated this "this is not the work of a day, but is the fruit of eleven years of investigation, during which I have operated 275 times for the cure of non-strangulated herniæ and have patiently established and perfected the method which I advocate." "This is not an already recognized proceeding for the cure of hernia that I have adopted, it is a personal method. I have not ignored any of those elements that have been utilized by numerous surgeons who have sought to cure hernia, but the mathematical perfection of certain points and a number of new details in the conduct of the operation constitute the method which is mine."

The first chapter is devoted to a discussion of the question of whether a radical operation should or should not be performed and the author reaches the conclusion that "among young subjects herniæ should be generally operated upon." There is no indication here of what is included in the term "young subjects."

A study of the table reveals the fact that a considerable number of children have been subjected to the operation and if this assertion is intended to apply to them we should feel disposed to dissent most emphatically from the conclusion. It is well recognized by the majority of surgeons that mechanical treatment is especially beneficial and often curative in the young and to submit them to an operation without first trying carefully and systematically to overcome the deformity by this means seems to us an unwarranted procedure.

In the second chapter the dangers of the radical cure are discussed and the statement is made that this danger is very slight, so slight that it is almost impossible to estimate it. Chapter three deals with the efficacy of the radical cure and the results of the author's operations. Here he recognizes the curability, even by bandages, among young patients, but says "there is greater reason for admitting this curability by an operation." Out of 266 cases he has observed 101 after a lapse of some time (29 from four to six months, and 72 after more than six months), among these 14 had recurrence of the hernia. The argument which is advanced that these fourteen recurrences should not be considered as relating to the 101 cases, but rather to the total number of 266 reviewed in this chapter, seems to us fallacious and ridiculous. It would be interesting to note by what process of reasoning he is able to arrive at the conclusion that there were no further cases of recurrence among the 165 cases not observed. In bad cases he estimates that the recurrence is equal to from four to five per cent., while in good cases it is almost nothing and he "considers that a subject who has submitted to a radical cure suffers less chance of recurrence of the hernia as a result of a strain than those whose abdominal walls have always been intact." In regard to the employment of a truss or bandage following the operation the following rules are laid down:

For men who have had a large hernia with very bad (weak?) abdominal walls a truss should be employed.

For men who have had a portion of the hernia composed of the large intestine a truss should also be employed.

In the vast majority when the operation has been completely successful it is best that they should wear over the cicatrix and the hernial region a pad with a girdle without a spring. This apparatus, which has nothing in common with the ordinary truss, protects the region of the operation from great shocks and allows the cicatrices to complete their consolidation without danger.

After a good operation a truss is useless.

In the opinion of the author only two of the many methods for the radical cure that have been published are worthy of particular mention. The methods of Macewen and of Bassini. He does not much believe in the efficacy of the folding back of the sac which constitutes the defense to the hernial region in the former case, and in order to be certain of its success it is necessary to carry the dissection very high, even into the abdomen when it corresponds to his own method. In the case of Bassini's operation he does not think much of the attempt to reconstruct an inguinal canal, but by opening the canal freely and carrying the dissection of the serous membrane very high a condition is obtained quite analogous to the one recommended by the author, a very complete dissection of the sac and a very large cicatrix; this is the reason for Bassini's success.

He says, "If I have not adopted the proceedings of these surgeons it is because I have found serious faults in their methods." "My method has the same advantages as theirs and other advantages as well."

The main points in Lucas-Championniere's method are the freeing of the sac, first from adhesions on its outer side, then of any that may unite the true hernial protrusion to the inner wall, then the opening of the sac and the reduction of the hernia. The sac must be freed well up to and beyond its point of exit from the abdominal cavity. It is then drawn well down and two or more sutures passed about the highest point within reach. If the neck of the sac is small two sutures are sufficient, but if it is large three or more may be required. These sutures are passed by means of an aneurism needle and the loop of the thread is cut leaving two sutures through the sac. These are then given a single twist and tied. If three sutures are employed each of them is united to the other by a twist, but if more than three are employed they are used in sets of two. That is, two are passed, twisted and tied, then the needle carries two others through the sac which are twisted on one another and the nearest free end is carried through the suture hole made by the nearer one of the first pair. After the neck has become thoroughly tied, the sac is cut off and the stump allowed The natural retraction of the stretched membrane carries the stump inside the abdominal opening and some distance from it.

In closing the fibro-muscular tissues it is important to obtain a strong cicatrix, and the strongest cicatrices are those which have resulted from union by first intention. Buried sutures are employed not to unite the pillars of the ring in the proper meaning of the word,

but to group and fuse together all the soft parts which can make a mass in the region and defend it against new attacks.

For this purpose a needle threaded with catgut takes up all the soft parts which constitute the walls of the canal, including all those which have been cut and torn. Sometimes the same suture after having been tied is passed again around another portion of the soft parts and again tied. Small but very strong masses are thus formed which contribute to strengthen the region. The barrier is completed by suturing to these deep tissues the cellular tissue above the muscular wall. This suture runs the whole length of the cord. This is considered a very important step. After the operation careful and firmly applied compression should be employed.

The author further applies his method to all varieties of herniæ, but we have given enough to convey an idea of his method. The book as an exposition of Lucas-Championniere's method of curing hernia is admirable, as a treatise on hernia, however, it is useless. No other methods are described and no credit is given to other investigators, the author insisting throughout the work that his method is perfectly satisfactory and that it overcomes all the imperfections in all other operations. As a claim for personal recognition the book is valuable, as a scientific exposition of the treatment of hernia it is seriously defective.

Samuel Lloyd.

THE READY REFERENCE HANDBOOK OF DISEASES OF THE SKIN. By GEORGE THOMAS JACKSON, M. D. 8vo. pp. 553. Philadelphia: Lea Brothers & Co. 1892.

Medical literature during the past decade has been considerably enriched by works treating of dermatology. In probably no branch of medicine have greater strides been made than in this.

In France, Kaposi's Hautkrankheiten, one of the most standard of text-books was translated into French ten years ago by Besnier and Doyon. Last year a second edition appeared with notes and comments by the translators, but the literature on dermatological subjects had increased to so great an extent in the time intervening between the first and second editions, that the number of pages devoted to these notes far outnumber those in the translated portion.

Another noticeable work, which also appeared in France this year, is Brocq's Traitement des Maladies de la Peau, a most comprehensive treatise of 900 pages and clearly defining the views of the present French school upon the subject.

Leloir and Vidal are also revising their Symptomatology and Histology of Skin Diseases, which when completed is intended to cover the entire field of dermatology, but dealing only with its histological pathology and symptomatology. Three parts have been issued so far, each part containing six plates in colors of sections of skin. The book is being translated into German by Eduard Shiff of Vienna and is published simultaneously with the French, the plates in both being from the same stones.

Probably the most magnificent atlas on dermatology is the International Atlas of Rare Skin Diseases, published simultaneously in Germany, France, England, and the United States, under the joint editorship of P. G. Unna, H. Leloir, Malcolm Morris and L. A. Duhring. Only two parts are issued yearly, each part containing three plates. One of the plates in the last number issued is of interest to the surgeons, representing a case of chronic glanders.

In Germany among the large number of works which have recently been issued are those of Max Joseph and Behrend of Berlin; a small text-book by P. Eichhoff; Lesser's Treatise on Skin and Genito-Urinary Diseases, which rapidly ran up to a sixth edition within five years; a revision of Kaposi and a book on treatment by Hans Hebra.

In England, Crocker, Anderson and Jamieson are among the most prominent of the many authors who have recently written text-books, and in Amsterdam there is in course of publication an atlas of photographs by Prof. Van Haren Noman.

Nor has this country been at all behind those of Europe in adding to the general literature on this subject in the way of text-books. We have recently had the third edition of Duhring; two editions of Robinson; three volumes of photographs by Fox; Piffard's superb plates; Morrow's and Taylor's Atlases; a new edition of Hyde and the second of Shoemaker, all of these being books which deal with

dermatology quite fully, while among smaller manuals may be mentioned those of Bulkley, Cutler and Rohè.

The last manual to appear and one of the most admirable of them all is the Handbook by Dr. Jackson.

The book is divided into two parts, the first of which deals with the anatomy and physiology of the skin in a brief but extremely comprehensive manner. The various lesions of the skin are next considered and the pages devoted to the general means employed in making a diagnosis are among the best that have ever been written on this subject.

Under the heading of "Therapeutic Notes" the author describes the various remedies which have been introduced into dermatological practice as substitutes for the greasy substances so long used as excipients for local applications. Among those mentioned are traumaticin, the various pastes and mulls, gelatine preparations and medicated soaps. Bassorin and Plasment are spoken of very highly. Of drugs, anthrarobin, creolin, dermatol, europhene, the aniline dyes, gallacetophenone, ichthyol, resorcin, thiol, tumenol, are all described. Of aristol, the author says, "I have made many comparative tests with it and older remedies in treating ulcers, and have found in the great majority of cases that the old friends were the best."

To the student nothing is more puzzling at times than the proper pronunciation of the many technical terms used in dermatology, making recourse to a dictionary a matter of frequent necessity. Dr. Jackson has overcome this difficulty by introducing the scheme of pronunciation used in Foster's Dictionary, a feature which we would be pleased to see adopted by other authors in their text-books.

Four of the most interesting pages of the book are devoted to "Some Dermatological Don'ts."

The second part is devoted to the consideration of the separate diseases of the skin and their treatment. While the space devoted to each article is necessarily short, it is worthy of comment that the amount of information packed into the space is remarkably large.

After giving a definition of the disease, the symptoms are detailed; then the ætiology, the differential diagnosis, and lastly, such plans of treatment as the author in his extensive practice has found of most benefit, and also such plans as other authorities recommend.

Dr. Jackson says in his preface: "No attempt has been made to discuss debatable questions. Hence pathology and ætiology do not receive as full consideration as symptomatology, diagnosis and treatment," and while the pathological changes are briefly described and differences of opinion, where such exist, are mentioned, the ætiology is nevertheless quite full and comprehensive, all the views of different authorities being considered.

Dr. Jackson does not accept as proved the conclusions of many of the French school and especially Besnier, that Lupus erythematosus is allied to Lu. vulgaris and is to be regarded as also a tuberculosis of the skin, holding that the fact that some cases have reacted to tuberculin injections is not sufficient, and further proof is necessary. Lupus vulgaris he regards as a tuberculosis cutis.

The so-called molluscum corpuscle is regarded as a changed epithelium cell and not the parasite—the psorosperm of Darier or the gregarine of Neisser. The theory that Paget's Disease of the Nipple is due to these "psorosperms" is not accepted.

In the treatment of epithelioma the author regards with favor Schwimmer's plan of curetting and the subsequent application of a 33½ per cent. pyrogallic acid ointment.

Erysipelas is regarded as an infectious disease and caused by the specific microörganism of Fehlheisen, although the possibility of its occurrence without infection by the microörganism he says must be entertained. In its treatment a large number of remedies are mentioned. Tincture of the chloride of iron, pilocarpin and jaborandi internally; externally, the old lead and opium wash, resorcin, ichthyol, Duckworth's chalk and lard ointment and the Kraske-Riedel method by scarifications and subsequent dressing with bichloride solution.

In alopecia prematura where no evident disease of the scalp is or has been present heredity is considered as the chief ætiological factor; next to that, improper hygiene of the scalp. Of the symptomatic alopecias four varieties are described, the most frequent of which is the A. furfuracea seu pityrodes, or dandruff, and in dealing further with the subject under the captions of Seborrhœa and Eczema seborrhoicum

its contagiousness is strongly noted and possible parasitic origin spoken of. On the mooted point regarding the ætiology of Alopecia areata Dr. Jackson considers that the advocates of the parasitic theory have not yet proved their case, and inclines to the view that it is a neurotic disease.

The diseases of the skin are arranged in alphabetical order as the author thinks no satisfactory system of classification has yet been made. While this is relatively true it is not absolutely so, and it seems to us that for the student (for whom this manual is especially intended, we take it), a classification as a working basis is important if not absolutely essential. It groups certain diseases under certain headings and shows the relationship of one disease to another so far as our present knowledge goes. To the physician versed in dermatology the alphabetical arrangement facilitates ready reference, but the beginner is apt to be puzzled by reading, for instance, eczema seborrhoicum, then elephantiasis and following that epithelioma.

The book contains fifty illustrations scattered throughout its pages and a chromo-lithograph of a case of Xanthelasma. Numerous foot-notes refer the reader to the various authorities quoted.

GEORGE D. HOLSTEN.

Annual of the Universal Medical Sciences. Edited by Charles E. Sajous, M. D., and seventy associate editors, Philadelphia: F. A. Davis Co., 1892.

The annual for 1892 compares most favorably with those of preceding years.

We are informed that next year will witness several changes. In order to compass this and at the same time extend the circulation in Europe, Dr. Sajous has changed his headquarters to Paris, with the expectation of remaining three years.

One improvement that is suggested is the addition of the address to the name of every author quoted. The annual will also be published in French.

A work of this kind cannot be dealt with in the same way as most books, but must be examined in the light of its purpose. Nor is any single observer entirely capable of criticising it as a whole, although he may be fully able to speak authoritatively of portions of the work. Its purpose is we think fully carried out. It is intended as an epitome of the work done in all branches of medicine, a compilation in little space of all the advanced work of the year. This is undoubtedly well sustained and the work is so much more complete and so well done that it stands far in advance of all the other annuals upon which we formerly relied for this information. The work can never take the place of independent investigation and compilation, but as an aid during the preparation of an article after this investigation is complete and as an index to the literature of the subject, it is simply invaluable.

It is almost impossible to select from such a work portions for criticism, but in this instance we naturally turn to the sections on surgery.

In Cerebral Surgery, by John H. Packard, no remarkable advances are noted, but the increase in the number of cases operated upon adds materially to the general knowledge and will materially aid in the final conclusions in regard to many of the procedures now under consideration. Some points made by Drouboix in fractures of the base of the skull are worthy of notice—he says that on examining the palate, it will be seen that the uvula is drawn to one side and that the other half of the soft palate is flaccid; the attempt to swallow a mouthful of liquid will be attended with difficulty and provoke coughing. Deductions may also be drawn from the anatomical relations of the nerves passing through the substance of the bone the impairment of their function indicating the seat of fracture in any given case. The escape of subarachnoid fluid from the ear is considered very rare; in order that it may occur, there must be an opening in the serous sheath of the auditory and facial nerves, at its point of reflection in the depth of the internal auditory meatus, and a channel must be formed thence, by the fracture, to the external meatus. When a similar flow occurs through the nose, it is probably due to a fracture of the ethmoid with tearing of the arachnoid sheath of the olfactory Dr. Packard also contributes the article on Diseases and Injuries of Arteries and Veins, and the one on Surgical Dressings and Antiseptics.

In the article on Thoracic Surgery, by J. McFadden Gaston, several remarkable cases of extensive injury to the ribs and pleura are reported. The general conclusion in regard to Bronchotomy through the chest walls continues unfavorable.

The surgery of the abdomen is thoroughly reviewed by J. William White. An interesting series of experiments are quoted from F. B. Robinson of Ohio, and F. T. Paul of England, in circular enterorrhaphy, and their methods are worthy of study and further experimentation. The discussion of appendicitis would indicate a tendency to "call a halt" in the general plan of operating, and to select the cases carefully before proceeding to the removal of the appendix. Treves of London, Rand of Brooklyn, and Lange of New York, are quoted as objecting, and to this list may be added the author of this section, Dr. White, if his notes fully express his views on the question. Dr. White also contributes the section on Syphilis, assisted by Edward Martin of Philadelphia.

In the article on Amputations, Excisions, and Plastic Surgery, Diseases of the Bones and Joints, by P. S. Conner and Leonard Freeman, Von Essen's statistics of amputations are interesting in showing the general improvement in the mortality in these cases since the beginning of the antiseptic era. A method of amputation by Neudörfer, attracts the attention; he determines the point where a bone is to be divided and then makes an incision running in the long axis of the limb, extending through the soft parts and the periosteum. The incision should be on the anterior or lateral surface of the limb to avoid the larger nerves and vessels. In the arm it should be six centimetres long, in the thigh twelve. The periosteum is then thoroughly loosened from the bone which is divided by a chisel as in an osteotomy; the lower fragment is luxated through the periosteum which is stripped from the bone and the soft parts are divided in one plane with a knife or a strong pair of scissors, the intimate relation of the tissues remaining undisturbed. The vessels are then ligatured, the periosteum is united longitudinally and transversely and the wound in the soft parts is closed by buried sutures and the skin by a continuous suture.

Diseases of the Rectum and Anus are treated by Chas. B. Kelsey of New York, Genito-Urinary Surgical Diseases, by E. L. Keyes and Eugene Fuller of New York, Orthopædic Surgery, by Lewis A. Sayre and Reginald H. Sayre of New York, Fractures and Dislocations, by Lewis A. Stimson of New York, Surgical Mycoses and Tumors, by Ernest Laplace of Philadelphia, Surgical Diseases, by Louis McLane Tiffany, and Ridgly B. Warfield of Baltimore, Traumatic Neuroses, by J. A. Booth of New York, and Anæsthetics, by J. M. Barton and J. Lewis Borsch of Philadelphia complete the volume.

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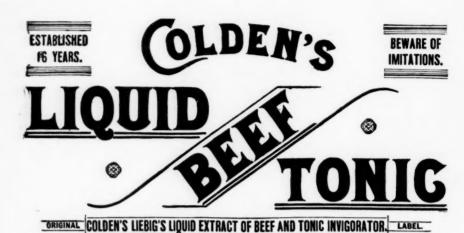
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